





# ARNOLD ARBORETUM

HARVARD UNIVERSITY



## BULLETIN

OF

## POPULAR INFORMATION

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POPULAR INFORMATION

JAMAICA PLAIN, MASS.

MAY 6, 1920

**Effects of the Severe Winter.** The winter of 1919-20, although less destructive to plants in the neighborhood of Boston than that of 1917-18, has been exceptionally severe. Once in December, before the ground was protected by snow, the thermometer at the Arboretum fell to 12° below zero; later heavy and numerous falls of snow buried and protected plants less than three or four feet high. Unfortunately the snow rested on a layer of ice which did not thaw until the disappearance of the snow at the end of March. This ice layer injured small plants, and this, or the cold nights in December, killed in the Nursery the seedling plants of *Juniperus Pinchotii*. This native of the Panhandle region of northwestern Texas is a handsome tree with bright red fruit. Recently introduced into gardens by the Arboretum, it was hoped that a tree which grows naturally in a region of excessive winter cold would thrive in New England. The heavy snow and high winds have broken the branches of several trees and shrubs, and the destruction of the fine species of the dwarf form of the Norway Maple (*Acer platanoides* var. *globosum*) by the weight of the snow on the branches is a serious loss. This plant was imported from Germany in 1888 and for several years has been an object of interest and curiosity to visitors to the Arboretum, especially those who like to study plants of abnormal growth; and its portrait has been thrown on the screen at many popular lectures on the Arboretum and its plants. Field mice, which have destroyed during the winter by girdling thousands of young trees in New England orchards and nurseries, have done comparatively little damage in the Arboretum. A number of shrubs have lost branches; a ring of bark has been entirely removed from the stem of one of the three plants of a Chinese Box Elder, *Acer griseum*, and this plant will

probably not recover. Other interesting young trees which have been badly injured by mice are *Acer mandshuricum*, the great Box Elder of northern Korea and Manchuria and *Acer Davidii* from western China. Rhododendrons, Kalmias and broad-leaved Evergreens are generally in good condition, although the Kalmias which last year produced an unusually large crop of flowers this year are carrying few flower-buds. A few conifers have suffered, but the damage to these plants is less serious than it was two years ago, and, judging by reports from Long Island and the middle states, the Arboretum conifers have suffered less than those in some of the collections further south. The young Cedars of Lebanon raised from seeds gathered in Asia Minor, and for many years believed to be proof against the rigors of the New England winter, have lost or will lose many leaves as they did for the first time two years ago. The buds appear to be uninjured and the trees will undoubtedly put out new leaves. Their spring beauty, however, is spoiled, and such losses of foliage will check their growth which up to two years ago had been more rapid than that of any other conifer in the collection. Two years ago the numerous specimens in the Arboretum of the Black Pine of Japan (*Pinus Thunbergii*) lost much of their foliage and the trees look even worse now than they did two years ago. The buds are generally alive, but it will be a long time before these trees regain their former vigor. This Black Pine is a southern sea-level tree and in this country is more picturesque than beautiful. In Tokyo, however, and by the sides of the great southern Japanese shore highway there are magnificent specimens. Raised at the Arboretum from seeds planted in 1893, *Pinus Thunbergii* was never injured here until the cold of the winter of 1917-18 ruined its foliage. The short-leaved southern Pine (*Pinus echinata*) has lost many leaves again as it did two years ago; and although this valuable tree finds its northern home on Staten Island and Long Island, New York, it will probably never grow to a large size here or prove itself important for the decoration of northern parks. The oldest specimen in the collection was raised here in 1879 from seeds collected at the Peaks of Otter in Virginia and has suffered less than the younger trees raised from Staten Island seeds. Young plants of the Mexican White Pine (*Pinus ayacahuite*) which have been growing in the Arboretum for several years and have not before been injured by cold look as if they had been browned by fire and will probably die. Small plants of *Abies magnifica*, the great Red Fir of the California Sierra Nevada, and *A. cephalonica* var *Apollinis*, from southeastern Europe, both trees of doubtful hardiness, are killed; and of the three trees of the California form of *Abies concolor* the *A. Lowiana* of English nurserymen and the *A. Parsonsii* of some American gardens, the leaves of two are for the first time badly browned, while those of the third are uninjured. Here and there a branch with brown leaves appears in the Pinetum, but on the whole the collection of conifers is in better condition than might have been expected. Among the trees which do not grow naturally in New England three are now conspicuous by the freshness and beauty of their foliage; these three trees are the Hemlock from the high mountains of the Carolinas (*Tsuga caroliniana*), the Spruce-tree of the Balkan Peninsula (*Picea omorika*), and a Japanese Fir-tree, *Abies homolepis* (or *brachyphylla*). The last is a tree of dense habit, dark green

leaves and purple cones; it must not be confused with another Japanese Fir-tree which botanists consider a variety of it and now call *A. homolepis* var. *umbellata*. This is a faster growing tree of open habit, with light green leaves and gray cones. It is less hardy than the typical form, and leaves on most of the specimens in the Arboretum have been browned during the past winter as they were two years ago. Except in general collections and as a curiosity this variety of *Abies homolepis* is not worth planting in this part of the world.

**A late spring.** By the first of April the frost was out of the ground here and there was every prospect of an early spring, but April has been a cold and rainy month with little sunshine and most spring flowers are opening nearly two weeks later than in normal seasons. They have so far, however, escaped the late frosts which too often in this climate ruin April flowers, like those of *Magnolia stellata*, *M. kobus* and early flowering Rhododendrons.

**Winter-flowering Witch Hazels.** The southern Missouri and Asiatic Witch Hazels have all flowered during the winter, but for some reason which it is not easy to explain their flowers opened five or six weeks later than in other years. *Hamamelis mollis* from central China is the handsomest of these plants and well deserves a place in winter gardens for its flowers with their large bright yellow petals and handsome leaves which in late autumn assume before falling brilliant shades of yellow. A Japanese species (*H. incarnata*), differing from all the other Witch Hazels in the dark red petals of its small flowers drooping on long stems, is a recent addition to the Arboretum collection and has flowered here this winter for the first time. As a botanical curiosity it is interesting, but judged by the first flowers it has produced in America it has little to recommend it as a garden plant.

**Cornus mas.** The Cornelian Cherry of old-fashioned gardens opened its first flowers on April 18th, and the leafless branches are still covered with its compact, many-flowered clusters of small bright yellow flowers which are unusually abundant this spring. This Cornel is a native of eastern Europe and western Asia, and for three centuries at least has been a favorite garden plant in western Europe. It is a large and shapely shrub and with a little care can be made to grow with a single stem in the form of a small tree. It is handsome from early spring until late in the autumn, for the leaves are large dark green and lustrous but fall without having changed their color, and the short oblong, scarlet, lustrous or rarely yellow fruit which hangs on stout stems is cherry-like in appearance and ornamental. The fact that the flowers are never injured by April frosts greatly adds to the value of this plant for the spring decoration of parks and gardens in the northern states.

**Corylopsis** is an Asiatic genus of the Witch Hazel Family with light yellow flowers in long drooping clusters appearing before the leaves which have a general resemblance to those of the Witch Hazels. Nearly all the species are represented in the collection but only *C. Gotoana*, a native of the elevated regions of central Japan, is worthy of general cultivation in eastern Massachusetts, for it is perfectly hardy here even the flower-buds having been uninjured by the exceptionally low

temperature of the winter of 1917-18. This is one of the handsomest of the early spring flowering shrubs which can be grown in this part of the country and one of the important Arboretum introductions. The largest plant in the collection is on Hickory Path near Centre Street and is now covered with flowers. A small plant of another Japanese species, *C. pauciflora*, growing on Hickory Path near *C. Gotoana*, is also now covered with flowers. This is unusual, for although the plant is hardy the flower-buds are often killed by cold, as are those of another Japanese species, *C. spicata*. The stems and branches of the Chinese species, *C. Veitchiana* and *C. Willmottae* are uninjured but the flower-buds are killed. These plants have flowered in the Arboretum, but two years ago they were killed to the ground and there is little hope that these handsome shrubs will prove useful for New England gardens.

**Prinsepia sinensis.** The value of this handsome shrub becomes more and more apparent with the passing years. The first plant in the Arboretum to unfold its leaves, these are already nearly full grown and by the time this Bulletin reaches its Boston readers the plants will be covered with bright yellow flowers. This *Prinsepia* is a perfectly hardy vigorous and fast-growing shrub; the young leaves and the flowers have never been injured by spring frosts, and it can be said of it that it is the best contribution Mongolia has made to our gardens. *Prinsepia sinensis* has proved difficult to propagate, but two years ago it produced for the first time a little fruit and this seed has germinated. It is possible, too, with skill and patience to increase this plant by cuttings, but until the Arboretum plants produce good crops of fruit *Prinsepia sinensis* will not be common in this country. If it could be obtained in sufficient quantities it would make a beautiful and impenetrable hedge as the stems and branches are armed with sharp spines.

**Early Flowering Rhododendrons.** Only three or four of the Rhododendrons which bloom before the first of May can be grown in this climate. The handsomest of these, *Rhododendron mucronulatum*, which has flowered every spring in the Arboretum for nearly twenty years, has perhaps not before been as thickly covered with flowers as it has been during the past ten days. A native of northern China and Korea it is a tall deciduous-leaved shrub inclined as it grows old to a straggling habit, with long slender branches and pale rose-colored flowers which open before the leaves appear and have never been injured here by April frosts. This is one of the handsome April flowering shrubs which can be successfully grown in this climate. The flowers are still in good condition on the plants in the large group on the lower side of Azalea Path. *Rhododendron dauricum*, which begins to bloom a few days earlier than *R. mucronulatum*, has been unusually handsome this spring as the flowers which are generally destroyed by frost have not been injured. It is a native of eastern Siberia and Manchuria, with bright rose-colored flowers and dark green leaves which in this climate remain on the branches until midwinter. There is an evergreen variety, (var. *sempervirens*), which has also flowered well this spring with the species on the upper side of Azalea Path. The flowers of the hybrid between *Rhododendron dauricum* and the Himalayan *R. hirsutum*, known in gardens as *R. praecox*, "Early Gem," are also in good condition this year; usually they are ruined by frost.



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**Asiatic Cherry-trees.** When this copy of the Bulletin reaches its readers in eastern Massachusetts the principal display of flowers in the Arboretum will be made by some of the Cherry-trees of eastern Asia and by early-flowering Plum-trees. As in previous years, the earliest of these trees to flower this spring is *Prunus concinna*, a native of the mountains of central China where it was discovered by Wilson. *Prunus concinna* is a small tree which first flowered in the Arboretum when less than three feet high. The flowers, which are white with a red calyx, are less beautiful than those of several of the other Asiatic Cherry-trees, but they are produced in the greatest profusion and are not injured by spring frosts; and as small plants flower as freely as larger ones this Cherry well deserves a place in collections of spring-flowering trees and shrubs. The Japanese *Prunus incisa* has opened its flowers this spring only two or three days later than *Prunus concinna*. It is a shrub or small tree with white or rarely pale rose-colored flowers which appear before the deeply lobed leaves unfold. The petals fall in a few days after the buds open but the calyx, which gradually grows red, remains on the fruit for two or three weeks and is decidedly showy. A form of this Cherry (var. *Yanakei*) with pure white petals and a bright green calyx is flowering for the first time in the Arboretum this spring. Although *Prunus incisa* is a common plant in Japan on the Hakkone Mountains and on Fuji-san, it has remained extremely rare in American and European gardens. It is in flower this year a few days earlier than the Chinese *Prunus tomentosa*, an early introduction of the Arboretum which has proved to be one of the handsomest of the early spring flowering shrubs in the neighborhood of

Boston. It is a vigorous plant five or six feet high, and when fully grown often broader than tall. The flowers open from pink buds as the leaves unfold and their bright red stalk and calyx make a handsome contrast with the white petals often blotched with rose color. The small scarlet lustrous fruit which ripens in June and is covered with short hairs is attracting the attention of pomologists in regions of intense cold in the interior of this continent where *Prunus tomentosa* has proved to be hardy. Crossed with *Prunus Cerasus*, if such a cross can be made, it might produce a race of garden Cherries which would probably be hardy further north than it is possible to cultivate successfully any of the varieties of that species. A form of *Prunus tomentosa* (var. *endotricha*) discovered by Wilson in western China flowers a few days later than the species from which it chiefly differs in the absence of hairs from the fruit. An Almond from northern China, *Prunus triloba*, blooms with or a little later than *Prunus tomentosa*. It is a tall shrub of open irregular habit, and its only beauty is in its flowers which are purest pink in color. No other plant in the Arboretum produces flowers more delicately beautiful in color, but although it has been flowering here now for nearly thirty years it is still rare in American gardens. The less beautiful double-flowered form (var. *plena*) is, however, a better known and more popular garden plant in this country. A single plant (*Prunus Arnoldiana*) of what is evidently a natural hybrid between *Prunus triloba* and *P. tomentosa* appeared in the Arboretum a few years ago among seedlings of the former. It is a vigorous upright growing shrub with a single stem, handsome white flowers which appear as the leaves unfold, cherry-like fruit which rarely develops, and leaves intermediate between those of its supposed parents. The large trees of the Sargent Cherry, *Prunus serrulata* var. *sachalinensis*, have lost this year some of their flower-buds especially from lower branches but are nevertheless well covered with their pink and rose-colored flowers. The flowers are short-lived, but their abundance and beauty, the hardiness of the tree which has not yet been attacked by any disease, the beauty of its ample dark green leaves brilliantly colored in the autumn and its bright and lustrous bark make this the handsomest Cherry-tree of large size which can be successfully grown in this climate. In recent years it has been difficult to obtain from Japan seeds of this northern variety of *Prunus serrulata* for the large trees have been generally cut in Hokkaido for lumber; and the plants now in the United States have been raised from the seeds produced by the Arboretum trees. A number of these seedling trees are beginning to flower in different parts of the country and will in the course of a few years be producing crops of fruit. This ripens in the Arboretum in June; and everyone with fruit-bearing trees of this Cherry should protect the fruit from birds and see that the stones are planted, for the Sargent Cherry is one of the handsomest trees which can be used successfully for the decoration of northern gardens and supplies the best stock on which to graft or bud many of the double-flowered Japanese Cherries, the handsomest and hardiest of which are forms of *Prunus serrulata* and its varieties. The Spring Cherry of the Japanese (*Prunus subhirtella*), the most delightful and floriferous, travellers

say, of all Japanese Cherries, is thickly covered with fast opening flower-buds and has not before given greater promise of beauty. It is a large shrub which is not known in Japan as a wild plant. Although cultivated somewhat in the gardens of western Japan it is uncommon in those of Tokyo and therefore has failed to attract the general attention of the visitors to the Flowery Kingdom who stick to beaten tracks. The rather small drooping flowers are pink when they first open but gradually turn white, and those of no other Cherry-tree in the collection remain in good condition for so many days. This plant is still rare in American and European gardens; it can be increased by grafting, and soft wood cuttings in the hands of a skilful propagator can be made to grow. Seeds, which the Arboretum plants produce in great quantities, do not reproduce the parent plant, however, and the seedlings generally grow into the tall slender trees which botanists know as *Prunus subhirtella* var. *ascendens*, and which are common in the forests of central Hondo. This tree has generally been overlooked or neglected as a garden plant, but is now flowering in the Arboretum. Much better known is the form of *P. subhirtella* (var. *pendula*) with pendulous branches which, long a favorite garden plant in Japan, was sent many years ago to Europe and then to the United States. This beautiful plant, which is perfectly hardy in Massachusetts has often grown badly here and died long before its time because European Cherry stocks have been used for multiplying it. The proper stocks for the Weeping Cherry are the seedling plants of *Prunus subhirtella* (var. *ascendens*) or seedlings raised from the seeds of that variety which probably have not yet been produced in this country. Seeds of the pendulous form sometimes produce plants with pendulous branches, and such plants are occasionally found among the seedlings of *Prunus subhirtella*. There are few flower-buds this spring on the weeping Japanese Cherry-trees in the Arboretum and these will open much later. The flower-buds of Peaches, including those of the wild Peach-tree of northern China (*Prunus Davidiana*), and of several Apricots have been killed in the Arboretum by the severe winter but Plums large and small are generally well covered with buds.

**The Canada Plum** so-called (*Prunus nigra*) is the first species to flower and the buds are already opening. This is a northern tree ranging in Canada from New Brunswick westward through the valley of the St. Lawrence River and along the northern shore of Lake Superior to Winnipeg; it occurs rather sparingly in northern New England, western New York and westward to Minnesota. It is a handsome little tree with dark close bark, a round-topped head of spreading branches, wide coarsely toothed glandular leaves, and large flowers, which unlike those of other American Plums turn pink as they begin to fade. Several forms selected for the excellence of their fruit are cultivated and valued by pomologists. A form of the Canada Plum found growing in Seneca Park, Rochester, New York, near the gorge of the Genesee River and believed to be a native plant in that region is when in flower one of the most beautiful Plum-trees in the Arboretum collection and well worth propagating as a garden ornament. *Prunus salicina*, better

known perhaps as *P. triflora*, flowers only a little later than the Canada Plum, and the flower-buds which completely cover the wide-spreading branches are already opening. This tree is interesting because it is the only native Plum in eastern Asia and the tree from which the so-called Japanese Plums of gardens have been evolved.

**Corylus chinensis.** The fact that this tree has again escaped injury by a severe winter and is flowering in the Arboretum for the second time will interest the large number of persons in this country who are now associated together for the study and improvement of nut-bearing trees. *Corylus chinensis* is a splendid tree widely distributed but nowhere abundant on the mountains of Hupeh and Szech'uan. It is a tree with spreading branches usually from fifty to seventy feet tall, with a trunk two or three feet in diameter, although Wilson measured one tree growing near Fang Hsien in Hupeh which was 120 feet high with a trunk nearly seven feet in diameter. No other Hazel of this size has been reported before or since. The Arboretum plants ripened a few nuts in the autumn of 1919; the nuts vary in size but are thick-shelled, and are enclosed in an involucre which also varies in shape and thickness. Compared with cultivated Hazel-nuts they have no comestible value. *Corylus chinensis*, however, may prove valuable as a parent of a race of large-growing Hazels with good fruit, or as a vigorous stock on which to graft some of the forms of *C. Avellana* with improved fruit. But whether it proves valuable or not in improving Hazel-nuts *Corylus chinensis*, if it grows here as it does on its native mountains, should prove an interesting and valuable addition to the exotic trees which can be cultivated in this country.

**The Nutmeg Hickory.** It is a matter of congratulation that this Hickory-tree (*Carya myristicaeformis*) has been growing for several years in the Arboretum and has not been injured by the severe winters of recent years. This is one of the rare and handsome trees of south-eastern North America, and one of the most interesting of Hickory-trees because it unites two distinct groups of species of these trees - the group with valvate bud-scales and thin-shelled nuts in thin husks, of which the Bitternut and the Pecan are representatives, and the group with imbricated bud-scales and thick-shelled nuts in more or less thickened husks, of which the Shagbark Hickory and the Pignut are representatives. The Nutmeg Hickory is a magnificent tree often a hundred feet high, with a tall stem and leaves silvery white on the lower side of the leaflets. The nuts somewhat resemble in shape those of the Pecan but are marked by longitudinal bands of small gray spots. The Nutmeg Hickory grows only in a few isolated stations from eastern South Carolina to eastern Texas. It is most abundant in southern Arkansas where the seeds were gathered from which the Arboretum plants have been raised.

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**Amelanchiers.** The forests of eastern North America surpass those of other regions of the northern hemisphere in the number of small trees and shrubs which enliven them with beautiful and often conspicuous flowers. Eastern North America is the home of the Hawthorns which grow here in an almost unbelievable number of species with innumerable individuals; in the Missouri-Texas region are more species and varieties of Plums, great and small, than in all the other countries of the world; in early spring swamps and their borders and low woods are gay with the bright yellow flowers on the leafless branches of the Spice Bush (*Benzoin aestivale*), the Leatherwood (*Dirca palustris*) and the Fragrant Sumach (*Rhus canadensis*). No other part of the world can boast a forest undergrowth more beautiful than that made by the so-called Flowering Dogwood (*Cornus florida*), one of the commonest of the small trees in all the region from southern New England to eastern Texas. Even Japan cannot make a braver and more varied show of Azaleas than our south Atlantic and Gulf States; poor in Rhododendrons and these of comparative insignificance, in its Laurel (*Kalmia latifolia*) eastern America possesses a broad-leaved evergreen shrub or small tree which grows naturally from New Brunswick to Louisiana and is not surpassed by many plants in the beauty of its flowers. Amelanchier is another plant in which North America has almost a monopoly; one small shrubby species grows on the mountains of central Europe, and there is another shrubby species in China and Japan. All the other species are natives of North America where Amelanchiers grow with many species from the Atlantic to the Pacific, and from Newfoundland to the Gulf States. Some of the species are trees and others large or small shrubs

they flower in the spring before the leaves appear or when they are partly grown, or, as in the case of a few species, when the trees are nearly fully grown, the period of flowering of the different species extending through several weeks. The species all have handsome flowers, with long delicate white petals, and small, dark blue, or nearly black pome-like fruit open at the top, with flesh which in most of the species is sweet and edible. It is these edible fruits which probably have earned for these plants one of their popular names, Service Berry. Shad Bush, another of their popular names, came from the fact that they were in flower when the shad began to ascend the rivers flowing into the Atlantic Ocean. *Amelanchier canadensis*, the first species to bloom in the Arboretum, has been in flower for several days. It is a tree which occasionally grows to the height of sixty feet with a tall trunk eighteen inches in diameter. The leaves begin to unfold as the flowers open and are then covered with pale gray silky hairs, making the whole plant look white at this time of the year. This beautiful tree does not grow naturally nearer Boston than the western part of the state; it is common in western New York, and it is the common and often the only species in the southern states in which it grows to the Gulf coast. Owing to an old confusion in determination and names this fine tree, which was originally named by Linnaeus, has been rare in gardens, an entirely different plant having long appeared in books and gardens under the name of *Amelanchier canadensis*. This is also a fine tree, differing conspicuously from *A. canadensis* in the red color of the young leaves which are destitute or nearly destitute of any hairy covering. This tree is now called by botanists *A. laevis*. It is one of the native trees of the Arboretum, and there are a number of specimens growing naturally on the bank above the Crabapples on the left-hand side of the Forest Hills Road which begin to flower a few days later than *A. canadensis*, and are easily recognized by the color of the young leaves. Another species which is a native plant in the Arboretum, *A. obovalis*, is a large shrub rather than a tree with young leaves like those of *A. canadensis* covered with white silky hairs. Large numbers of this shrub have been planted along the drives and in the other Arboretum shrubberies; they will still be in bloom when this Bulletin reaches its Boston readers and will make this week one of the pleasantest of the year to visit the Arboretum. Five or six other species of the eastern states are now well established in the Arboretum collection on the grass path which follows the left-hand side of the Meadow Road; they are small shrubs rarely more than five or six feet high, in some species spreading from the roots into clumps of considerable size. They are all delightful plants well suited for the decoration of small gardens or the margins of shrubberies. Generally, however, they are unknown to garden lovers.

**Some Early-flowering Viburnums.** The first Viburnum to bloom in the Arboretum this year is *Viburnum alnifolium*, the Hobble Bush or Moosewood of cold, wet northern woods. It is a large shrub spreading by shoots from the roots, with broad flat clusters of small flowers surrounded by a ring of large pure white neutral flowers, dark green leaves with prominent veins, which turn orange and scarlet in the autumn,

and fruit in drooping clusters, bright red at first when fully grown and dark blue or nearly black at maturity. This is one of the handsomest of the American *Viburnums* but it has proved a difficult plant to establish here, although in other Massachusetts gardens it has grown better than it has in the Arboretum where, however, it at last appears to have become accustomed to its surroundings. In Japan there is a *Viburnum* (*V. furcatum*) closely related to and very much like the Hobble Bush, from which it chiefly differs in the shorter stamens which are hardly more than half the length of the corolla, and in the deep groove on the ventral side of the stone of the fruit. *Viburnum furcatum* in Japan, where it grows from the mountains of central Hondo to Saghalin, is a shrub sometimes ten or twelve feet high with smooth, red-brown branches and branchlets. Like its American relative, this Japanese *Viburnum* has proved difficult to establish, but a plant is now opening its flowers here, two or three days later than those of *V. alni-folium*, and for the first time in the Arboretum. In a few days the flowers of another early-flowering species, *V. Carlesii*, will open. This shrub has been found only among seashore rocks in two localities in Korea and has already become a popular garden plant in this country and Europe. Its real value is found in the white, extremely fragrant flowers which are arranged in small compact clusters and open from rose-colored buds. As the buds in the cluster do not all open at once the pink buds among the white flowers add to the beauty of this shrub in early spring. Late in the autumn the small dull olive green leaves turn dark rich wine color.

**Early Azaleas.** The first Azalea to open its flowers this spring is the Korean *Rhododendron* (all Azaleas are now called *Rhododendrons*) *poukhanense*. This Azalea, which is a common plant on the bare mountain slopes in the neighborhood of Seoul, was first raised at the Arboretum in 1905 from seeds collected in Korea by Mr. J. G. Jack. As it grows here this Azalea is a low, wide, compact bush which never fails to cover itself with its large, rose-pink flowers. Some persons do not find this color pleasing, but the flowers of no other Azalea in the collection have such a strong and pleasant fragrance. There is a considerable number of these plants in the bed on the upper side of Azalea Path. The plants ripen good crops of seeds; the seedlings are not difficult to raise and there is no reason why this plant should not be more common in gardens than it is at present. The flower-buds of *Rhododendron* (Azalea) *Schlippenbachii* will open a few days later than those of *R. poukhanense*. This Azalea grows on the exposed grass-covered cliffs of the east coast of Korea as a low bush with branches clinging to the ground and far northward as a tall shrub sometimes twelve or fifteen feet high under trees in open or dense forests. It grows further north than other Asiatic Azaleas, and only the North American *Rhodora* reaches a higher latitude. The flowers of this Azalea appear before the leaves and are pale pink marked at the base of the upper lobes of the corolla with dark spots and are about three inches in diameter. There can be little doubt of the hardiness of this plant, for in Korea it grows to its largest size where the winter temperature often falls to 30° below zero Fahrenheit; and in the Arboretum the flower-

buds have not been injured by the low temperature of recent winters. There is every reason to believe therefore that it will be possible to cultivate *R. Schlippenbachii* anywhere in the northern states where the soil is not impregnated with lime. If this prediction proves true New England will be able to add to its gardens one of the most beautiful of all the Azaleas. This plant, unfortunately, is still rare in gardens. Although known to Russian botanists as early as 1872, it did not reach England until twenty years later when the late J. H. Veitch sent to London a plant which he had found in a nursery garden near Tokyo. The plants in the Arboretum were raised here from seeds brought by Mr. Jack from Korea, and at different times a few plants have reached this country from the Yokohama Nursery Company. Fortunately Mr. Wilson during his journey in Korea in 1917 secured a large quantity of the seeds of this Azalea; this has been widely distributed by the Arboretum in the United States and Europe and has produced several thousand plants. There is reason to hope, therefore, that this loveliest of the hardy Asiatic Azaleas will become a common inhabitant of northern gardens.

**Broad-leaved Evergreens.** In addition to the two Rhododendrons with evergreen leaves mentioned in the first Bulletin of the present year there are only two broad-leaved evergreen plants which flower here in April and are perfectly hardy. They are *Andromeda floribunda* and the Leather Leaf (*Chamaedaphne calyculata*). The former is a native of the high southern Appalachian region and has been known in gardens for at least a century; it is not, however, often seen in those of New England in which, with the exception of the Laurel (*Kalmia*) and a few Rhododendrons, it is the handsomest evergreen shrub which can be successfully grown. It is beautiful, too, throughout the year for the dark green leaves, although not large, are always lustrous; the flower-buds, which are formed in the autumn, are large, nearly white, and conspicuous during the winter, and open into bell-shaped white flowers arranged in short terminal clusters which cover the plants during several weeks and are not injured by spring frost. This *Andromeda* under favorable conditions sometimes grows five or six feet high, with a diameter often greater than its height. It is a good subject to use as a single specimen or on the margin of beds of taller growing evergreens, like Rhododendrons or *Kalmias*, and no broad-leaved evergreen is better suited for the decoration of large rock gardens. The related species from Japan, *Andromeda japonica*, is a larger plant, sometimes tree-like in growth in its native country, with larger and more beautiful flowers which unfortunately in this climate are generally ruined by spring frosts. The Leather Leaf is an inhabitant of cold, wet northern bogs which it sometimes covers almost to the exclusion of other plants. It is a dwarf shrub with small obtuse scurfy leaves and small, white, axillary flowers. The Leather Leaf is a less beautiful plant than *Andromeda floribunda* but it is a hardy, broad-leaved evergreen and therefore valuable in a region where so few such plants can be successfully grown. Although naturally a bog plant, the Leather Leaf flourishes when planted in drier soil and the plant in the Shrub Collection and its dwarf form (var. *minor*) are unusually full of flowers this spring.



## ARNOLD ARBORETUM

HARVARD UNIVERSITY

BULLETIN  
OF  
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**Pear Trees.** The Arboretum collection of the wild types of Pear-trees, especially those of eastern Asia, is probably now the largest to be found in any arboretum, and as many of the species now flower and produce large crops of fruit this collection is of particular interest to pomologists who hope to find among these trees a stock resistant to blight on which to graft their orchard Pear-trees with edible fruit. The earliest of the Asiatic Pear-trees this year, *Pyrus ussuriensis*, began to flower two weeks ago. This tree, which is common in northern China, Korea and Manchuria and the only species which has a foothold in Japan where it has recently been discovered, inhabits more northern and colder regions than any other Pear-tree. If any Pear-tree proves hardy therefore in the northern interior part of this continent it should be this species; and if it proves resistant to blight it should yield the hardiest of all Pear-stocks. No other species attains such a large size as is shown by the photograph made in 1919 by Wilson in Korea of a tree which was sixty feet high, with a tall trunk seven feet round and a head of spreading branches seventy-five feet across. The flowers are not as large as those of some of the other species, but as a flowering tree *P. ussuriensis* is one of the most beautiful of all Pear-trees for the flower-buds and the opening flowers are deeply tinged with rose-color. The fruit is subglobose, green, hard and one-half to three-quarters of an inch in diameter and, like that of most wild Pear-trees, is of no comestible value. Among other Pear-trees this northern species, as a young tree at least, can be easily recognized by its smooth pale bark. *Pyrus ovoidea*, which was introduced into western gardens from northern China, and is an old inhabitant at the Arboretum, is now considered by botanists a variety of the Korean Pear-tree (var. *ovoidea*). It blooms two weeks later than the more northern

tree; the flowers are larger and pure white; the fruit is larger, with succulent flesh, and, unlike that of most Pear-trees, is broad at base and narrow at apex and pale yellow. The leaves of no other Pear-tree in the collection assume such brilliant autumn colors. The large specimen of this tree near the Forest Hills gate has been covered with flowers this spring. For the beauty alone of its autumn foliage this tree should find a place in collections of ornamental trees. Inoculation of seedling plants of another Chinese Pear-tree, *P. Calleryana*, shows, as much as such tests prove anything, that they are immune to attacks of the Pear blight; and pomologists now believe that in this tree they have found the stock which will make the production of pears in this country a more certain and profitable industry than it has been before. Many thousand seedlings have been raised by the Department of Agriculture of the United States and by different experimental stations from the seeds produced by the Arboretum trees; if these prove as valuable as American pomologists now believe them to be they will demonstrate the value of museums of science like the Arnold Arboretum and more than justify the labor and money it has expended in its explorations in eastern Asia. Unfortunately the only specimens of this Pear-tree outside of China which produce seeds are in this Arboretum, and although the trees produce good crops of fruit the supply of seeds from the Arboretum will remain far short of the demand. Another Pear-tree introduced from western China by Wilson, *Pyrus serotina*, is of interest to the students of cultivated fruits as the wild type from which have been derived the round, gritty Sand Pears which in many varieties have been cultivated for centuries by the Japanese who obtained them originally from China. Many forms of these Sand Pears, in the early days of Japanese intercourse with the outside world, were sent to the United States and Europe. The trees are handsome, with beautiful flowers and brown or greenish yellow fruits which in some forms are extremely ornamental, but western palates and digestions cannot cope with the hard fruit full of grit which is not even worth the trouble of cooking, although in Japan even little children appear to enjoy these pears emerging from the struggle without loss of teeth or internal revolution. The cultivated Japanese Sand Pears crossed with cultivated garden Pears produced several years ago in the United States the Keiffer and Lecomte Pears. These, although rather hard, were large and well suited to ship long distances. Much was expected of them, especially in the southern states where large orchards were planted. The trees, however, proved so susceptible to the blight that their cultivation has now been practically abandoned. As an ornament of gardens *Pyrus serotina* is worth growing for its large white flowers more or less deeply tinged with rose-color, and the deep bronze color of its unfolding leaves. As a fruit tree for western countries none of the Asiatic Pear-trees, except the north China *Pyrus Bretschneideri*, give any promise of value. In the Arboretum this tree, where it was raised many years ago from seeds sent from Peking, produces yellow, globose, juicy fruits from one to two inches in diameter and of excellent flavor. Nothing is known of this Pear as a wild tree, but it is evidently the origin of the large juicy pears which are conspicuous in the Peking market in September and are said to keep well into the winter. This Pear-tree has been in the Arboretum since 1882 and has never been attacked by blight, although trees of species like *P. betu-*

*laefolia* growing with it have suffered seriously from this disease. It therefore seems possible that good results in hardiness, freedom from disease and improvement of fruit might possibly be obtained in seedling forms of this Chinese tree or by crossing it with some of our garden varieties. The European and western Asiatic Pear-trees bloom rather later than the Chinese species but their flowers will soon open. The original collection of Pear-trees is on the left-hand side of the Forest Hills Road; a larger and more complete collection has recently been planted in the hollow at the eastern base of Peter's Hill, and there are good specimens of the species introduced by Wilson from western China on the southern slope of Bussey Hill with other Chinese trees and shrubs.

**Asiatic Crabapples.** The flowers of these trees are unusually late this spring, but unless the weather continues exceptionally wet and cold there will be open flowers on at least a few species by the 17th, and many others will be in full bloom by the 22nd or 23rd of the month. The flowers of these trees make one of the principal spectacular displays of the year in the Arboretum, and only that made by the Lilacs attracts a larger number of visitors. Most of the trees are well covered by buds, but there will be no flowers on a few individuals, including the plant of *Malus floribunda* at the foot of the bank on the left hand side of the Forest Hills drive. This is unusual for *Malus floribunda* rarely fails in May to excite admiration by its countless thousands of deep rose-colored flower-buds and white petals. Other trees of this Crabapple in the Arboretum will flower this year as usual, and the tree of *Malus arnoldiana*, a hybrid of *Malus floribunda* and an even more beautiful plant, in the group on the Forest Hills Road which did not flower last year, is now covered with flower-buds. For forty years the Arboretum has been engaged in forming this collection of Crabapples in which are now found all the American and Asiatic species, many distinct varieties of the species and a number of hybrids. It still lacks, however, the wild type of the species of western Europe (*Malus sylvestris*) which it has not been possible to find. This is unfortunate for this Crabapple has played a more or less important part in the development of the cultivated Apple-trees of orchards. The Crabapples in the Arboretum hybridize freely among themselves and it is useless to plant seeds gathered from these trees with the expectation that they will reproduce the plants from which they were gathered. The seedling trees may prove worthless or they may be superior to any of the Crabapples now cultivated. The characters of any species, variety or hybrid can be preserved in its descendants only by means of grafting or budding; and it is for this reason that many of the handsome plants in the Arboretum collection are still rare in other collections. For those fortunate persons to whom the beauty of a plant means more than its identity and correct name Crabapples raised from seeds gathered in collections like that of the Arboretum might be recommended, but such seedlings will require names to make them salable and gardeners' names for plants of doubtful parentage will only add to the perplexities of the students of cultivated plants. Stock plants raised by grafts from correctly named individuals would in the hands of a few competent nurserymen supply in time the country with correctly named Crabapples and save planters much loss of time and many disappointments.

The eastern form of *Malus baccata* (var. *mandshurica*), a native of Manchuria, Korea and northern Japan, is again the first plant in the collection to open its flowers. This as it grows in the Arboretum is a bush-like tree about fifteen feet tall and broad; the flowers are white, an inch in diameter, and more fragrant than those of any other Apple-tree in the collection. The fruit is yellow or red and not much larger than a pea. The delightful fragrance of its flowers is the chief attraction of this variety and makes it well worth a place in gardens. Almost as early to flower is *Malus micromalus*. It was first sent to Europe from Japan in 1856 under the name of "Kaido," a name which in Japan has been given to another plant, and owing perhaps to this confusion of names very little has ever been heard of it in Europe or the United States. In Japan it has been seen only in gardens, and Japanese botanists have considered it a hybrid brought to their country from China. From other Crabapples it differs in its upright growing branches which make the tree conspicuous by its pyramidal habit. The flowers open from deep rose-colored buds and are pale pink and hardly more than half an inch in diameter, and are followed by small yellow fruits. The large specimens in the Peter's Hill Group are not flowering this year, but a small specimen recently planted on the left hand side of the Forest Hills Road is covered with flowers. Another early flowering species, the Parkman Crab (*Malus Halliana* var. *Parkmanii*) is, as usual, blooming well this year. It is a small, vase-shaped tree with dark bark, dark green leaves tinged with purple as they unfold and rose-red semi-double flowers unlike in color those of any other Crabapple. This little tree is considered by some persons the most beautiful of the Crabapples, but although it reached Boston in 1862, in the first consignment of plants which came to the United States direct from Japan it is not often seen in gardens, even in those of Japan to which it was originally brought from China. During the next two or three weeks Crabapples, first the Asiatic and then the American species, will be in bloom in the Arboretum. As their flower-buds enlarge attention will be called to some of the other species in later issues of these Bulletins.

**Unfolding Leaves.** A careful examination of unfolding leaves is recommended to students and lovers of trees. They are often beautiful and always interesting; in some of the large difficult genera like *Quercus* they afford characters by which many of the species can be readily recognized in early spring. On the Japanese *Cercidiphyllum* and on the native tree Shad-bush the young leaves are deep red bronze color; on many trees the young leaves are more or less thickly covered with silvery white hairs and on others entirely destitute of a hairy covering. Among Beech-trees the winter-buds of the European species are still closed when the young leaves of our native Beech are unfolding, and those of one of the Japanese species are nearly fully grown. In the Arboretum there are now Maples with fully grown leaves close to species whose bud-scales are only just beginning to open. These few examples of variation serve to show that there is something of interest to learn about every tree and shrub from its leaf-buds and unfolding leaves during the month of May.

## ARNOLD ARBORETUM

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**Lilacs.** The cold wet spring has delayed the opening of the flowers of Lilacs as it has those of other plants, but buds on many Lilacs are now swelling rapidly and there is every reason to believe that many of the plants will be in full bloom by Saturday, the 29th; and that unless unseasonable weather is experienced during the next few days the last days of May and the early days of June will see the general Lilac collection at its best. The large part of the Arboretum collection consists of seedling varieties of the plant which has been a favorite in gardens for centuries, and to most persons the only Lilac—the *Syringa vulgaris* of botanists. It is now known that this shrub came originally from the mountains of Bulgaria and that it reached western Europe by the way of Constantinople in 1597. The date of its introduction into the United States is not known, but it was a common garden plant here before the end of the eighteenth century and may have been here much earlier. There are specimens in the collection raised a few years ago from seeds of the wild Bulgarian plants. These are interesting because it is possible by comparing them with modern Lilacs to see the changes three centuries of selection and cultivation have made in these plants.

Hardly a week passes without a letter addressed to the Arboretum asks for the names of the best, or of the best six or of best twenty-five Lilacs. There are now one hundred and fifty named forms of the common Lilac in the collection. They are all or nearly all handsome plants, and no two persons ever agree about their individual value. Some persons prefer flowers of one color and other persons prefer flowers of another color; some persons like the Lilacs with double flowers and

others detest them. All the forms of the garden Lilac have practically the same habit and foliage, and the same inconspicuous fruit; they all bloom freely nearly every year, and breeding and selection have not affected their perfume as it has that of so many much "improved" plants, like many of the modern Roses. There is considerable variation in the size of the individual flowers; the double flowers open generally a little later than the single flowers and last longer, but there is really little difference in the time of flowering of all these plants. The size of the flower-cluster varies somewhat on the different forms; it is larger on young plants than on old ones, and it can always be enlarged by severe pruning which increases the vigor of the flower-bearing branches. Choice therefore depends on color, and really none of these Lilacs are "best" for everybody; one color or one shade is "best" for one person and another color or another shade is "best" for another person. Many persons who come to the Arboretum find the old Lilacs which have been growing on Bussey Hill for nearly a hundred years more beautiful than any of Lemoine's recent creations because they are the Lilacs which have long been common in old New England gardens and beloved by generations of New Englanders. A choice of Lilacs being largely a matter of taste in color or of association, it is useless to ask the Arboretum to make selections for its correspondents. If persons want Lilacs their only way to go about getting them in an intelligent way is to come to the Arboretum when the Lilacs are in flower and personally make their selection. The plants are all legibly labelled, and many of the kinds growing in the Arboretum can now be found in several American nurseries.

**Early Lilacs.** The white-flowered *Syringa affinis*, which is usually the first Lilac to bloom in the Arboretum, has no flowers this year. This is unusual for this plant rarely fails to produce an abundant crop of flowers. The earliness and the delightful fragrance of the flowers give this plant value for the spring garden. The variety with mauve-colored fragrant flowers (var. *Giraldii*) is blooming as usual; it is a tall, unsightly shrub, and except when in flower of no decorative value. The flower-buds of the Arboretum plant of *Syringa oblata*, another north China early flowering species, have been killed, but in other gardens near Boston they are uninjured. This is one of the handsomest of the species and no other Lilac has such thick and lustrous leaves which in the autumn assume brilliant shades of orange and red. The flower-buds, however, are too often injured in this climate, although the plant itself is perfectly hardy. By crossing this plant with a double-flowered form of *Syringa vulgaris* the plant known as *S. hyacinthiflora* was obtained in Europe many years ago. It is a large, shapely bush, with good foliage and small clusters of double bluish lilac flowers as fragrant as those of *S. oblata*. This hybrid is now in bloom. A Chinese Lilac discovered by Wilson, *S. pinnatifolia*, is also in flower. The pinnate leaves of this plant make it interesting among Lilacs, but the small white flowers in short clusters are without ornamental value. The flowers of another rare Chinese species, *S. Meyeri*, will soon open; and generally all the hybrid Lilacs, and all the species are well covered with flower-buds.

**A Hybrid Shad Bush.** In 1892 the Arboretum received from Heinrich Zabel, Superintendent of the Botanic Garden at Zurich, seeds of an Amelanchier which he had obtained from the Simon Louis Nursery near Metz, and called *Amelanchier canadensis grandiflora*. He considered, perhaps correctly, that his plant was a hybrid between *A. canadensis* and *A. laevis*. The leaves are certainly intermediate between those of these species; the flowers, however, are only just now open, nearly three weeks later than those of *A. canadensis* and ten days after the petals of *A. laevis* have fallen. The flowers, too, of this plant are larger than those of either of its supposed parents, and larger and more beautiful than those of any Amelanchier which has ever grown in the Arboretum. The Arboretum plants are large shrubs rather than trees, but they look as if they would have formed a single trunk if they had been pruned. Whatever may have been the origin of this plant, or whatever habit it may assume, it is, when in flower, the most beautiful of all the Amelanchiers, and this week one of the conspicuous plants in the Arboretum. Several other handsome and interesting Amelanchiers are also in bloom in the collection on the left-hand side of the Meadow Road. Among them is the species of China and Japan, *A. asiatica*, and *A. vulgaris* of Europe, the only Amelanchiers which grow naturally outside of North America. The curious northern *A. Bartramiana* with small flowers in one or few-flowered clusters, and four or five other species from the northeastern part of the country, are still in flower or are beginning to shed their petals. The Amelanchier collection, however, is by no means complete for several of the western species have not yet proved amenable to cultivation in the east.

**The Buckeye Collection** on the right hand side of the Meadow Road beyond the Lindens is in good condition, and the southern species recently introduced by the Arboretum into gardens will all flower well this year. Buckeye, it must be remembered, is the name by which American Horsechestnuts (*Aesculus*) are popularly known in the regions where these plants grow naturally. From the Horsechestnuts of the Old World they differ, except the California species, in the absence of a gummy exudation on their winter-buds. As in previous years the earliest of these American plants to bloom is the form with leaves of seven leaflets of the so-called Ohio Buckeye from western Missouri (*Aesculus glabra* var. *Buckleyi*). The flowers of another yellow-flowered species, *Aesculus arguta*, a small shrub from central Oklahoma and northern and central Texas, will soon follow. This interesting little plant is related to the Ohio Buckeye, from which it differs chiefly in the nine narrow leaflets of the leaves and in its small flowers. Beautiful interesting flowers will open on Buckeyes and Horsechestnuts during and several weeks.

**Rhododendron (Azalea) Vaseyi.** This species of the southern Appalachian Mountains, which after the Rhodora is the first of the American Azaleas to open its flowers in the Arboretum, is in bloom. The pure pink flowers appear on the leafless branches, and in delicacy and purity of color are not surpassed by the flowers of any other plant. It is only within comparatively recent years that this Azalea has been

known to botanists or has found its way into gardens. It is perfectly hardy; the flower-buds are not injured by severe cold, and in time it will grow into a tall usually rather narrow shrub. There are no large plants yet in the Arboretum, but many small ones have been planted during the last two or three years on the sides of the Meadow Road and by the pond at its junction with the Forest Hills Road.

**Malus theifera**, one of Wilson's discoveries in western China, with its long spreading and irregularly ascending branches has such an unusual and picturesque habit for a Crabapple that it is easy to recognize at any season of the year. When covered with its innumerable clusters of rose-red buds and pale rose-colored or nearly white flowers it is one of the handsomest of the Asiatic Crabapples. Judging by the behavior of several plants in the Arboretum, they flower only on alternate years. Last spring the largest specimen in the Peters' Hill group was covered with flowers; this year it has not produced a single flower-bud. The plant on the southern slope of Bussey Hill and a younger one in the group on the left hand side of the Forest Hills Road are now covered with flowers and are objects of interest and beauty.

**A New Crabapple.** Flowering branches of a remarkable new Crabapple have been sent to the Arboretum from a garden in Brookline. It is evidently a hybrid, and there can be little doubt that one of the parents is the curious variety of *Malus pumila* from Turkestan and southwestern Siberia known in gardens as *Malus Niedzwetzkyana*; the other might well be *Malus floribunda*. Of this species it has the slender branchlets and the pubescence on the young leaves which soon become nearly glabrous and green. The bark and wood are tinged with red and thus show the influence of *M. Niedzwetzkyana* as does the red juicy flesh of the fruit which ripens in October and is about an inch in diameter. As a garden plant the value of this new hybrid is in the color of the flowers which is dark rose-red, and much more beautiful than that of the flowers of *Malus atrosanguinea*, which is the common red-flowered Crabapple of gardens. The flowers are fully an inch and a quarter in diameter and are produced in as great profusion as those of *Malus floribunda*. In habit the three plants of this hybrid which are known resemble *M. floribunda* and are as hardy. The handsomest of all the red-flowered Apples which have yet been seen, this hybrid promises to be an important addition to garden plants. Unfortunately nothing is known of its history beyond the fact that the Massachusetts Nurseryman who sold them to their present owner bought them as *Malus Niedzwetzkyana* from some one whom he has forgotten.



## ARNOLD ARBORETUM

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**American Hawthorns.** Twenty of the twenty-two natural groups in which the North American species of *Crataegus* can be arranged are now largely represented in the Arboretum collection. Species of the *Aestivales* and the *Brachyacanthae* which contain some of the most distinct and interesting species of the genus are not in the collection. To the *Aestivales* only four species are now referred, inhabitants of the coast region of the south Atlantic and Gulf states with an outlying station in North Carolina. They grow where the ground is wet, usually in deep depressions often filled with water throughout a large part of the year and are slender trees or small or large round-headed shrubs. The flowers which are as large or larger than those of any other Hawthorn, with usually twenty stamens and deep rose-colored or pink anthers, are arranged in usually three-flowered clusters and open before the leaves unfold. These plants are almost universally called "May Haws" in the region where they grow because the scarlet, juicy, sub-acid fruit ripens in spring; it makes excellent jelly, and great quantities of it are used for this purpose. No species of this group has been planted in the Arboretum; they are perhaps worth trying here for *Crataegus* is generally a hardy genus, and it is impossible to predict that any of its species will fail in any locality. The Arboretum will be glad to hear if *Crataegus aestivalis* or its related species have been cultivated successfully in any part of the world. *Crataegus brachyacantha*, the "Pomette Bleue" of the Arcadians of western Louisiana, is a large and handsome tree with lustrous foliage, small flowers in many-flowered crowded clusters, and bright blue fruit about half an inch in diameter. One of the handsomest of the American Hawthorns, it differs from all the species of the genus in the color of the fruit. The extreme southern part of Arkansas, eastern and western Louisiana

and eastern Texas is the home of this tree, which often covers large, often submerged areas, and is sufficiently common, when the trees are covered with flowers, to be a conspicuous feature in the landscape. Seedlings of this tree have been raised several times at the Arboretum but have not proved hardy. The other species of the group *Brachyacanthae*, *Crataegus saligna*, is common on the banks of streams at high altitudes on both slopes of the Continental Divide in Colorado where it is particularly conspicuous in early autumn from the brilliant orange and scarlet colors of the leaves. This plant has been raised several times at the Arboretum but has not yet established itself here. Such failures are probably due to accident for there seems to be no reason why *Crataegus saligna* should not grow as well in the Arboretum as the other Colorado species.

The distribution of the different groups of the American species is interesting. The most widely and generally distributed is the *Crusgalli*, to which the so-called Cockspur Thorns belong. Individuals of this group do not form as large colonies as those of some of the other groups, but they are generally distributed from the valley of the Saint Lawrence River in the Province of Quebec to the shores of the Gulf of Mexico in western Florida and westward to Iowa, eastern Kansas and Oklahoma, and to western Texas. The species are most abundant in southern Missouri, Arkansas and western Louisiana. The *Punctatae*, of which the type is *Crataegus punctata*, one of the largest of the American species, is northeastern but ranges southward on the high Appalachian Mountains to northern Georgia, and to Missouri and Arkansas where it has a number of representatives. Species of the *Virides* grow on the coastal plain of the south Atlantic states and in the coast region of the Gulf States to western Texas; they are most abundant in Texas, western Louisiana, southern Arkansas and in the valley of the Mississippi River as far north as Illinois. East of the Mississippi River individuals of this group are not numerous, but westward, especially in eastern Texas, they cover great tracts of low ground; and the type of the group, *Crataegus viridis*, is under favorable conditions the most gregarious of all the American Hawthorns. This group is well represented in the Arboretum by *C. nitida*, a large tree of the bottom-lands of the Mississippi River in Illinois and one of the handsomest of all Hawthorns. The *Pruinosae* is a northern group but ranges southward on the Appalachian Mountains, and reaches Missouri where it is abundant with numerous species in the southern part of the state and northern Arkansas. The *Tenuifoliae* is a distinctly northeastern group but is largely represented on the Appalachian Mountains as far south as North Carolina, with a single species in southern Arkansas. The *Coccineae* is composed of large trees with large leaves and flowers, and large and showy scarlet fruit; it is entirely northeastern and most abundant in western New York, southern Ontario and northeastern Illinois. The *Dilatatae* is another group with large leaves, flowers and fruits and is confined to the northeastern states, and to Missouri and eastern Kansas. It is well represented in the Arboretum by *Crataegus coccinioides*, now one of the handsomest trees of the collection. The *Rotundifoliae* are entirely northeastern, and one of the species, *C. rotundifolia*, is the most northern in its range of the American Hawthorns. Species of this group are not found south of

Pennsylvania or west in the United States of Indiana. The *Intricatae* with many species is interesting because most of the representatives are small shrubs which until recent years have been entirely overlooked by botanists. This Group is widely distributed from Canada to Texas and is best represented in Pennsylvania and Michigan; it apparently does not occur in the coast region of the south Atlantic and east Gulf States; it has not been noticed in Louisiana and is rare, except in northwestern Arkansas, in the states west of the Mississippi River. Belonging to this Group are many attractive garden plants now growing in the Arboretum. In the *Uniflorae* are only small shrubs with small flowers; nowhere very common they are distributed from eastern New York to Alabama and Texas. Handsome plants are the two shrubs which compose the *Triflorae* and which grow in the hill regions of northwestern Georgia and northern Alabama. The *Pulcherrimae*, *Bracteatae* and *Silvicolae* are small groups confined to the south-eastern states, with one species of the *Silvicolae* in eastern Louisiana; these three groups still imperfectly known. The *Microcarpae* with three species are distinguished by their small fruits and by the principal veins of the leaves which extend to the point of the lobes as in other species of *Crataegus* and also to the bottom of the sinuses between the lobes. Two of these species, *C. apifolia* and *C. spathulata*, are well scattered over the southern states; and the third, *C. cordata*, the so-called Washington Thorn, is a rare and local tree in the region from western North Carolina to southern Missouri and southern Illinois. It is hardy in the Arboretum where it is the last species to flower. An old inhabitant of gardens, it is not surpassed in the beauty of its foliage in autumn or the brilliancy of its fruit which remains on the branches until spring. The great *Flavae* Group is distinctly southeastern with many species which vary in habit from large trees to shrubs, and are well distinguished from the species of other groups by the conspicuous glands on their mostly obovate-cuneate leaves, petioles and corymbs, by their zig-zag branches and by the hard dry flesh of their green, orange or red fruit. The plants of this Group are very common in southern Georgia, western Florida, and southern Alabama, with a single species in eastern Louisiana, near the banks of the Mississippi River in West Feliciana Parish, and with several species in the southern Appalachian region up to altitudes of about two thousand feet. This distinct and interesting Group is well represented in the Arboretum by old trees of *Crataegus aprica* from western North Carolina. The *Macracanthae*, better known as the *Tomentosae*, is one of the most important eastern groups, common with many species in Canada and the northern states, but absent from the southeastern states, the coast region of the east Gulf States and Louisiana, and very rare in eastern Texas and Arkansas, but represented in the southern Rocky Mountain region. The fruit of some of the northern trees of this group is perhaps more beautiful than that of the plants of the other groups. Several species of the *Macracanthae* flower and produce fruit in the Arboretum. The *Douglasianae* are black-fruited trees and shrubs of the northwestern and interior parts of the continent, with one species in the Lake Superior region of northern Michigan. All the species of this Group are growing well in the Arboretum, as are those of the *Anomalae* a northeastern Group related to the *Macracanthae* and *Douglasianae* by the pres-

ence of longitudinal cavities on the inner faces of the nutlets of the fruit. The *Molles*, which is most closely related to the *Coccineae*, is mentioned last that attention may be drawn to some of the species which are already in flower. The distribution of this Group is peculiar. It is represented in the valley of the St. Lawrence River in the Province of Quebec, in Maine, eastern Massachusetts and northern Delaware; from western Vermont and Massachusetts and from western Pennsylvania it is common westward to eastern Nebraska and Kansas; it occurs in middle Tennessee, northeastern and eastern Mississippi and in northern Alabama where there is a single species. It is largely represented in Missouri; there are several species in Arkansas where they are most abundant in the valley of the Red River; in eastern Texas several species are widely distributed, abounding in the valley of the lower Brazos River and extending westward to that of the San Antonio. The Group has no representative in Louisiana, only two in Mississippi and one in Alabama; in the rest of the country, so far as is now known, the Group is not represented. The largest trees are found in this group; they have large leaves more or less covered with hairs, especially early in the season, large flowers in many-flowered clusters, and large, scarlet or rarely yellow, usually dry and mealy, often edible fruit. The Group is North American with the exception of *Crataegus peregrina*, a plant raised many years ago at the Arboretum from seeds received from the Botanic Garden at Petrograd. This handsome tree has large, dark purple fruit unlike in color that of any American species. Its native country is still unknown, but it has been suggested that it might have come originally from Persia or central Asia. Several trees of *C. peregrina* are now in full bloom in the Arboretum. Several other species of this Group are now covered with flowers. Large trees of *C. arnoldiana*, *C. arkansana* and *C. submollis* deserve attention. The first was discovered many years ago growing wild in the Arboretum, and although now commonly cultivated is known as a wild plant only in a few isolated stations. The large scarlet fruit, which ripens at the end of August or early in September, makes this the handsomest of the Thorns in late summer. *C. submollis* is another species which was first noticed growing in the neighborhood of the Arboretum but is now known to grow in Maine and the Province of Quebec. The pear-shaped fruit ripens four or five weeks later than that of *C. arnoldiana*. The scarlet fruit of *C. arkansana* is still brilliant on the branches in November. There are many other species of the Mollis Group now in flower, and different Hawthorns will be opening their flower-buds here during the next five or six weeks.

The Arboretum is a good place in which to study Hawthorns. Most of the Old World species and varieties are established, and some three hundred and fifty American species now flower and ripen their fruit here every year. For those parts of the country in which the soil is impregnated with lime and the winter climate severe, no other genus can furnish such a variety of trees and shrubs with handsome and conspicuous flowers and fruit.

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**Japanese Azaleas.** The flora of Japan contains many species of Azaleas, and in early spring their brilliant flowers enliven innumerable hillsides. Many species and varieties are favorite garden plants in Japan, and Japanese gardens owe much to these plants. In distribution the Azaleas of Japan are generally southern, and only a few species are found in the northern part of the empire. All of the species will probably flourish in the southern United States; and many of them will succeed as far north as Long Island and possibly in Newport, Rhode Island. Of the sixteen Japanese species three are well established and hardy in the Arboretum; a northern species, *Rhododendron* (all Azaleas are now called Rhododendrons by botanists) *Albrechtii*-related to our *Rhodora* but with red flowers, judging by the climate of the region in which it grows, should also be hardy here. This handsome plant, however, which was first raised at the Arboretum twenty-five years ago, has not been a success here. Another northern species, *Rhododendron Tschonoskii*, with the smallest flowers of any Azalea, is an old inhabitant of the Arboretum but is without value as an ornament of gardens. Two beautiful Azaleas from the mountain forests of central Hondo, *Rhododendron Rehderianum* and *R. pentaphyllum*, have not yet been sufficiently tested in the gardens of this country; they may be expected to be able to bear the cold of Massachusetts winters, but appear difficult to establish. Another Japanese Azalea, *R. mucronatum*, generally known as "Azalea ledifolia" or as "Azalea indica alba," has been seen in American gardens for the last eighty years. It is very often found in the old gardens of the southern states; it is hardy and often cultivated on Long Island, and occasionally lives for many years in sheltered positions in eastern Massachusetts. The three Japanese species, which have proved themselves,

after a trial of twenty-five years, to be perfectly hardy and first-class garden plants in eastern Massachusetts are *R. Kaempferi*, now considered a variety of *R. obtusum*, *R. japonicum* and *R. reticulatum*, better known as *R. rhombicum*. The first of these plants is the only red flowered Azalea which is hardy in this climate. Thousands of seedlings have been raised in this country in recent years and it will soon become common in eastern gardens. It has been largely used in the Arboretum, and late in May and in the early days of June its flowers furnish the most surprising and spectacular display of the year. The flowers are delicate, however, and when fully exposed to the sun lose their color; and this Azalea gives most satisfaction when it is planted in the shade of trees or on the northern border of a wood of conifers. In the Arboretum the most successful group of this Azalea is behind the Laurels (*Kalmia*) and in front of the Hemlocks at the northern base of Hemlock Hill. The plants bloom a week later than those in more exposed situations and their flowers last much longer in good condition. The tallest plants in the Arboretum are now eight or nine feet high and although growing in complete shade never fail to flower.

*Rhododendron japonicum* has been growing in the Arboretum as long as Kaempfer's Azalea, and by many persons it is considered a handsomer plant. It is a round-topped rather compact shrub usually not more than three or four feet tall, with flame-colored flowers three inches across. It is only in recent years that the value of this plant in American gardens has been recognized, for it was long supposed, in the Arboretum at least, to be one of the numerous forms of the short-lived and usually unsatisfactory hybrids sent to this country chiefly from Holland and known commercially as "Azalea mollis." A beautiful yellow-flowered variety of *R. japonicum* (var. *aureum*) has been found in Japan, and a few plants have reached the United States, where two years ago it flowered for the first time in a Massachusetts garden. This plant promises to be an important addition to the number of hardy Azaleas which can be grown in this climate. A handsome race of hybrid Azaleas was obtained several years ago in Europe probably by crossing *Rhododendron japonicum* with the yellow-flowered Azalea of eastern China, usually known as *R. sinense*. To this race of hybrids the general name of *R. Kosterianum* has been given. The best known plant of this hybrid origin is probably the one called "Antony Koster." It is a handsome plant, but not always entirely hardy in this climate where it is usually short-lived. About eight years ago T. D. Hatfield, gardener of the Hunnewell Estate at Wellesley, Massachusetts, crossed *R. japonicum* raised from seeds collected by Professor Sargent in Japan with *R. sinense* raised from seeds collected by Mr. Wilson in eastern China. There can be no doubt about the parentage of this plant. This new Azalea, which has been named *R. Kosterianum*, "Miss Louisa Hunnewell" bears large clusters of orange-colored flowers which open as the leaves unfold; the plant is perfectly hardy, and the flower-buds were not injured by the exceptionally severe winters of 1917-18 and 1919-20. If anyone in the United States has raised a handsomer shrub it is unknown to the Arboretum. During the last seventy-five years several hundred different hybrid Azaleas have been made in Europe and the United States; accurate and reliable records of

the parentage of these hybrids, however, have not been kept, and published statements of their parentage are often mere guesswork. Certainly many of these hybrids have been obtained by crossing not only species but hybrids. This mingling of plants, themselves often of unknown or uncertain origin, has produced difficulties of determination which no amount of study will probably ever overcome; and of all hybrid Azaleas the parentage only of this Wellesley plant is really known, a fact which certainly adds to its value and interest.

The third Japanese species which is now well established in the Arboretum is *Rhododendron reticulatum*, the oldest name for the plant more generally known as *R. rhombicum*. This plant is common over a large part of Japan, growing on open wind-swept hillsides, on the borders of the forest and in the shade of thick woods. The flowers are deep magenta color, red-purple or rose-color, and do not harmonize with those of several other Azaleas, but when *R. rhombicum* is isolated or planted with white-flowered plants it is when in flower one of the most beautiful and distinct of all hardy Azaleas. A white-flowered form (var. *albiflorum*) is known to Japanese botanists but this plant, which is said to be rare, is not in gardens.

**Early-flowered American Azaleas.** Before the flowers of *Rhododendron Vaseyi* have entirely faded those of the two most widely distributed species of eastern North America, *R. nudiflorum* and *R. canescens*, begin to open. These plants are common from New England to Texas; they have pink, very fragrant flowers which open before and as the leaves emerge from the bud, and very similar in general character, will perhaps sometime be considered varieties of one species. They have been planted in considerable numbers in the Arboretum and grow equally well in open borders or in the partial shade of woods. Before their flowers fade those of the flame or yellow-flowered Azalea (*R. calendulaceum*) of the Appalachian Mountains, the most splendid of American Azaleas, will begin to open.

**The Rowan Tree**, as the European Mountain Ash (*Sorbus Aucuparia*) is often called, has certainly not before in the Arboretum been more thickly covered with its wide clusters of white flowers or appeared to be in a most satisfactory condition. The largest and best of the Arboretum trees were sown by birds; there are several of these trees in different parts of the Arboretum and others are constantly springing up. Handsome at this season of the year, they are more beautiful in the autumn when the branches bend under the weight of the clusters of scarlet fruit which birds eagerly seek. Several plants of a Chinese Mountain Ash, *Sorbus discolor* (sometimes called *S. pekinensis*) in the group of these plants on the left hand side of the Valley Road near the Swamp White Oaks, now covered with flowers, show the ornamental character of this tree at this season of the year. This Mountain Ash is a tall, slender, hardy tree with leaves composed of narrow, long-pointed leaflets pale on the lower surface, broad open clusters of snow-white flowers, which are followed by small yellowish white fruits in drooping clusters. *Sorbus alnifolia* is also very full of flowers; it is a common Japanese tree, one of the species of an Old World section of the genus with

simple leaves, that is leaves not divided like those of the Rowan Tree into numerous leaflets, which in Japan sometimes grows to the height of sixty feet. In the Arboretum, where this tree has been growing for twenty-five years, there are shapely pyramidal specimens from twenty to thirty feet tall. The leaves are dark green, three or four inches long, and nearly full grown when the flowers open; these are small and arranged in compact six- to twelve-flowered clusters, and are followed by small, scarlet and orange fruits which remain on the branches after the leaves fall and until eaten by birds. There is a specimen of this Sorbus near the Cherries on the right hand side of the Forest Hills Road. The species and varieties of Sorbus were first planted in a group in the Arboretum on the bank above the Shrub Collection near the Forest Hills entrance. Several of these trees, including the eastern American species, are still growing here; but as this bank was too hot and dry, and not large enough for more than a few plants, another plantation of Sorbus has been made in the cooler ground by the Meadow Road. The plants grow better here but the group, like most of the large groups of trees in the Arboretum, requires more room for a proper display of all the interesting species and varieties. Mountain Ashes (Sorbus) suffer severely from the attack of scale insects and can only be kept in good condition by the annual use of the sprayer.

*Rosa omeiensis* has opened its flowers this year several days before *R. Hugonis* and *R. cinnamomea* which are usually the first Roses to flower in the Arboretum. This Chinese Rose, which is common on the mountains of western China, gets its name from Mt. Omei, one of the sacred mountains of the Empire, where it is common. It is a hardy, fast-growing shrub with erect stems covered with bright red prickles, white fragrant flowers hardly more than an inch in diameter, and bright red fruit on elongated fleshy, yellow stalks. On its native mountains it sometimes grows to the height of twenty feet. Judged by the way it has grown in the Arboretum, this Rose should make an excellent hedge for New England gardens.

*Aesculus georgiana* is covered again with its compact clusters of large red and yellow flowers. This southern Buckeye has not been injured by the severe winters of 1917-18 and 1919-20, and is certainly one of the best new plants which have been brought into our gardens in recent years. When first discovered it was believed to be confined to the neighborhood of Stone Mountain in central Georgia, and to be always a shrub in habit, but is now known to range northward in the Piedmont region to North Carolina, and often to grow into a small tree. The oldest plants in the Arboretum are beginning to assume a treelike habit, and in the parks at Rochester, New York, *Aesculus georgiana* is a shapely small tree with a straight well developed trunk. Many other Horsechestnuts and Buckeyes are now in flower: and the large group of these trees and shrubs on the right hand side of the Meadow Road is just now one of the most interesting and attractive in the Arboretum.



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**Some of the Trees now in flower.** The Horsechestnut of southeastern Europe, *Aesculus Hippocastanum*, when it is covered from top to bottom, as it is this year in the neighborhood of Boston, with its great erect clusters of white flowers is the most splendid object among the trees hardy in the northern states. There are several varieties of this tree in the Arboretum collection but none of them grow to such a large size or are as handsome in habit or in their flowers as the original tree. The double flowers of one of these abnormal varieties, however, have the advantage of lasting longer on the trees before fading. The European Horsechestnut only really flourishes in deep cool soil, and although it has been largely used to shade city streets in this country and in Europe it is not suited for such a purpose for the heat and drought of cities often cause it to lose its leaves at midsummer. Its place is in parks and gardens and by country roadsides. This tree appears to have been more generally planted in western New York than in other parts of the United States, probably because Rochester has long been an important center of the nursery business. No finer individual trees, however, can be found in this country than some of the specimens now more than a hundred years old which are growing in gardens in Salem, Massachusetts. They show what can be expected of this tree in New England where the Horsechestnut ought to be a hundred times more common than it is at present. Among the red and pink-flowered Horsechestnut trees, hybrids of *Aesculus Hippocastanum* and a red-flowered American Buckeye, are a number of handsome trees. The best known of these hybrids, *Aesculus carnea*, is the "red-flowered Horsechestnut" which is now a common tree in the suburbs of Boston. More conspicuous when in flower is a red-flowered variety known in nurseries as *Aesculus Briottii*. The tree in the Ar-

boretum of this variety is unusually full of flowers this year. Several of the Horsechestnut-trees with red and yellow flowers are handsome when in flower. They are natural hybrids which originated in Europe, some of them more than a century ago, between the yellow-flowered American *Aesculus octandra* and one of the red-flowered southern Buckeyes. The name of this hybrid is *Aesculus versicolor*. It appears to have been better known in gardens before the middle of the last century than it is now. There is a large tree of this hybrid in a garden near the corner of Pond and Eliot Streets, Jamaica Plain. Three Magnolias of the southern Appalachian Mountains, *Magnolia Fraseri*, *M. tripetala* and *M. cordata*, are also unusually full of flowers this year. With the exception of these and the Horsechestnuts the tree in the Arboretum now most conspicuous for its abundant and beautiful flowers is

**Cornus controversa.** This is a widely distributed tree in Japan, Korea and western China. In western Szech'uan Wilson photographed a specimen sixty feet high with a trunk seven feet in girth. In the Cornus collection on the right-hand side of the Meadow Road plants raised from seeds collected in western China by Wilson in 1907 are now in bloom, but the largest of these Cornels in the Arboretum is in the Peters' Hill Nursery. This plant was sent here in 1913 by the Park Department of the City of Rochester, New York; it is now about twenty-five feet high with a short trunk and a head twenty-six feet in diameter; the branches are long, crowded, and spread at right angles with the stem, drooping slightly at the ends, the lowest sweeping the ground. The upper side of the branches is thickly covered with the flat flower-clusters six or seven inches in diameter, and raised on erect stems. The flowers are white or white faintly tinged with yellow, and are followed by black shining fruits which are eaten by the birds as fast as they ripen. As it grows on Peters' Hill this Cornel is a magnificent plant and the handsomest of the genus in the Arboretum with the exception of the species with white floral bracts represented here by *Cornus florida* and *C. kousa*. To the student of botanical geography *Cornus controversa* is interesting as another living witness of the relationship between the floras of eastern Asia and eastern North America. For in the genus *Cornus* with many species there are but two with alternate leaves, *Cornus controversa* in eastern Asia and *C. alternifolia* in eastern North America. *Cornus controversa* was growing in the Veitch's Nursery near London in 1880, but it has remained little known or understood in gardens owing to a confusion of this species with *Cornus macrophylla*, a Himalayan and eastern Asiatic tree with opposite leaves. Other trees which add beauty and interest to the Arboretum at this time are three Viburnums, the eastern American *V. prunifolium*, which has already dropped its flowers, and *V. Lentago*, and the Japanese *V. Sieboldii*. Not many small trees are more useful than these American Viburnums for the decoration of American parks and gardens, and fortunately nurserymen realize this fact and now grow them in large quantities, especially *V. Lentago*. The flowers of *V. prunifolium* are whiter than those of *V. Lentago* which are faintly tinged with yellow, but the flower-clusters and the leaves of the latter are larger. *V. prunifolium* is more inclined to grow with a single trunk than *V. Lentago* which is often a large arborescent shrub.

**Arnold Arboretum Hybrids.** Except with Roses, no attempt has been made at the Arboretum to produce hybrid trees or shrubs. Several hybrids, however, have appeared here from time to time, and the following, of which descriptions have been published, or will be published, are now well established here. Such hybrids are always interesting, and among those which have appeared in the Arboretum are a few which are more valuable than their parents, and in two instances at least the handsomest garden plants in the genera to which their parents belong. The Arboretum hybrids are *Pterocarya Rehderiana*, *Sorbus arnoldiana*, *Forsythia intermedia primulina*, *Malus arnoldiana*, *Malus rubriflora*, *Malus Dawsoniana*, *Prunus arnoldiana*, *Pyrus congesta*, *Cornus arnoldiana*, *Betula Jackii*, *Viburnum Jackii*, *Berberis notabilis*, *Lonicera amoena arnoldiana*, and *Aesculus Harbisonii*. Another Barberry, *Berberis ottawensis*, believed to be a hybrid of *Berberis Thunbergii* and *B. vulgaris*, which was first described from a plant in the Arboretum connected with the Dominion Experimental Farm at Ottawa, has appeared several times among seedlings in this Arboretum where it has proved to be a handsome and distinct plant. There is a large specimen of this hybrid on the right-hand side of the entrance to Azalea Path from the Bussey Hill Road. The most valuable of the Arboretum hybrids for general cultivation in this part of the world are *Pterocarya Rehderiana*, *Malus arnoldiana* and *Sorbus arnoldiana*. The *Pterocarya*, which is evidently a hybrid of the Caucasian *P. frazinifolia* and the Chinese *P. stenoptera*, is much harder than its parents and has grown more rapidly in the Arboretum than any of the species of this interesting genus of the Walnut Family. Several of these hybrid plants appeared here in 1879 from seeds sent from the Arboretum Segrezianum in France as seeds of *P. stenoptera*, so that although the plants were raised here the crossing of the two species occurred in France. The grove of these trees which shades a stretch of Hickory Path near Centre Street is one of the most interesting and attractive groups in the Arboretum. The trees send up many suckers from the roots and for several years have flowered freely and produced fruit. This hybrid is an important addition to the number of interesting and handsome trees which can be successfully grown in this climate. *Sorbus arnoldiana*, which appeared here in 1907 among seedlings of Chinese *Sorbus discolor*, is a fast-growing, vigorous tree already nearly twenty feet tall, with smooth, lustrous, yellow-gray bark, erect branches forming a broad compact symmetrical head, leaves with the narrow leaflets of *Sorbus discolor*, and the compact, slightly convex flower-clusters of *Sorbus Aucuparia*, as broad as those of *S. discolor*. The fruit is pink and in color unlike that of any of the species of *Sorbus*. This hybrid is the handsomest Mountain Ash in the collection where it has grown more rapidly than most of the species of the genus; and there now seems to be every reason to hope that it has enabled the Arboretum to add to the list of ornamental plants hardy in New England another tree as valuable as *Malus arnoldiana*. This tree, which appeared in the Arboretum many years ago, has been so often noticed in these Bulletins that it is not necessary now to do more than to repeat the fact that it is probably a hybrid of *Malus floribunda* and some other Asiatic Crabapple, probably one of the hybrids of *Malus baccata*; and that, in the judgment of many persons, it is the hand-

somest Crabapple now cultivated. *Malus rubrifolia* is the name which will be given to the hybrid Crabapple recently mentioned in Bulletin No. 5 of this volume. It finds a place in the list of Arboretum hybrids because it is now known that it was either raised from seeds gathered in the Arboretum or that it was a seedling pulled up from the neighborhood of the Arboretum plants of *Malus Niedzwetzkyana*. These Arboretum hybrids show that new plants may appear spontaneously in any large collection of cultivated plants, that such spontaneous hybrids are sometimes valuable and that others, although interesting, can add little or nothing to the beauty of gardens. They show, too, that if the fertilization of the flowers of one plant by the pollen from the flowers of a different species or hybrid can produce such results as *Sorbus arnoldiana* and *Malus arnoldiana*, systematic and intelligently directed hybridization might with the abundant material here produce plants more beautiful than any now known in our gardens.

**Rhododendrons.** The severe winter has not killed any of the plants in the Arboretum collection, but many Rhododendron branches have been broken by the weight of snow and ice, and the flower-buds of a few of the hybrids have been injured. The southern Appalachian *R. carolinianum* was the first species to open its buds this year and for the last ten days the plants have been covered with their small, rose-colored flowers. Almost as early were some of the forms or hybrids of *R. caucasicum*. The most satisfactory of these for general cultivation in this climate is probably "Boule de Neige," which is a dwarf round-headed plant with good foliage and dark green leaves. It is perfectly hardy and rarely fails to flower. "Mont Elanc" is another of these plants which can be depended on to give satisfaction. As it grows in the Arboretum it is a dwarfer plant than "Boule de Neige," but the clusters of flowers and the flowers are larger; the flowers when the buds first open are rose color but soon become white. There are other named hybrids of *R. caucasicum* in the collection, but there is still much for us in this country to learn about the origin, correct names and hardiness of this race of Rhododendrons. The flower-buds of the Caucasian *R. Smirnowii* were uninjured by the winter and the plants are covered with the handsome pink flowers which make this one of the desirable Rhododendrons for Massachusetts gardens. Hybrids of this plant raised in England which are hardy in the Arboretum have lost their flower-buds, but those of a hybrid of the Japanese *R. Metternichii*, a species which grows badly here, with one of the hybrids of *R. catawbiense*, also raised in England a few years ago, are uninjured. The flower-buds of the two dwarf hybrids, *R. myrtifolium* and *R. arbutifolium*, useful plants to border beds of larger growing broad-leaved evergreen shrubs, are covered with uninjured flower-buds. The Rhododendrons most commonly found in American gardens are hybrids of *R. catawbiense* of the southern United States, and the first of them to flower here, *R. catawbiense album* has been in bloom for several days. One of this race called "Bismarck," which came to the Arboretum from Dresden, also flowers early and is unusually handsome this year. The largest number of Rhododendrons will probably be in bloom on Saturday and Sunday, the 12th and 13th of June. The collection is at the base of Hemlock Hill close to the entrance to the Arboretum from South Street. This entrance is most easily reached from Forest Hills by following South Street past the Bussey Institution.

## ARNOLD ARBORETUM

HARVARD UNIVERSITY

BULLETIN  
OF  
POPULAR INFORMATION

JAMAICA PLAIN, MASS.

JUNE 18, 1920

**Late Flowering Lilacs.** Among these are plants which can add much to the beauty of northern gardens in the last weeks of June and in early July. They are eastern Asiatic with the exception of the Hungarian *Syringa Josikaea*, which is the only one of these plants which has not been introduced into gardens since this Arboretum was established, and belong to the group of true Lilacs in distinction to the "Tree Lilacs" which bloom later and differ in their stamens which are longer than the corolla, while in all other Lilacs the stamens are shorter than the corolla and are hidden in its tube. The first of the late flowering true Lilacs from eastern Asia which reached the Arboretum was *Syringa villosa* which was raised here in 1882 from seed sent by the late Dr. Bretschneider, at that time physician attached to the Russian Embassy at Peking. This has proved the most valuable of these plants. It is perfectly hardy; it grows rapidly into a large, round-headed, compact bush which is often fifteen feet high and broad; it flowers every year, and few shrubs are more floriferous. The flowers are arranged in long, narrow clusters and are pale rose-pink, flesh color, or occasionally nearly white. The leaves, which are long, comparatively narrow, long-pointed, and dull green, are not attacked by the fungus which often disfigures in summer the leaves of the common garden Lilacs. Unfortunately the odor of the flowers, which is not very strong, however, is distinctly disagreeable. This is the only one of the late-flowering Lilacs which has been used successfully by the plant breeder. Crossed in the nurseries of the Museum d'Histoire Naturelle in Paris with *Syringa Josikaea*, it has produced a race of Lilacs of vigorous growth with the habit of the Chinese plant, and in some of its forms with flowers more or less deeply tinged with the violet color of the Hungarian parent. To the handsomest of these hybrids with violet-colored flowers the name "Lutèce" has been given. This has

not before in the Arboretum been more covered with flowers than it has been this year, and certainly no shrub of recent introduction into our gardens better deserves a place in them. Another plant of this race known as "Eximea" is also flowering well this year. It differs in its more compact clusters of rose-colored or reddish flowers which on opening become light pink.

Although still little known as a wild or as a garden plant, another northern species, *Syringa Wolfii*, promises to be valuable in early summer gardens. It reached the Arboretum in 1906 from Petrograd where it had probably been sent from northern Korea or Manchuria by the Russian traveler Komarov. The foliage resembles that of *S. villosa*, but the flowers are arranged in much larger clusters and are smaller and violet purple; their color is not unlike that of the hybrid "Lutèce" but they are smaller and in denser clusters. *Syringa Sweginzowii*, an other north Chinese plant, came to the Arboretum from Petrograd in 1910. With each succeeding year the estimate here of the beauty and value of this plant is increased. It is a tall narrow shrub with slender erect stems, dark dull green pointed leaves, and long narrow flower-clusters; the flowers are delicately fragrant and half an inch long, with a slender corolla-tube and flesh-colored in the bud are nearly white after the buds open. Even very small plants of this Lilac flower freely. Not very unlike this species in habit, *Syringa yunnanensis* from south-western China differs in its more fragrant flowers which are white, faintly tinged with rose color. Another related species, *Syringa microphylla*, is interesting because, unlike other Lilacs, it flowers in the Arboretum twice during the year, once the middle of June and a second time in October. The flowers are nearly white and pleasantly fragrant. *Syringa tomentella*, an older name for the plant later called *Syringa Wilsonii*, is a tall, vigorous, fast-growing shrub with erect stems, dull green leaves, and open, long-branched panicles of pale rose-colored flowers. *Syringa Julianae*, like the last a recent discovery in western China, is a late flowering plant closely related to the north China *S. pubescens*. It has the same shaped flowers with the long narrow corolla-tube, but they are arranged in a shorter cluster, and are less fragrant than those of the northern plant. The beauty of the flower-clusters of *S. Julianae* is increased by the contrast between the violet purple color of the outer surface of the corolla and the white inner surface of its lobes. Two new species, *Syringa reflexa* and *S. Sargentiana*, discovered by Wilson in western China, with leaves very similar to those of *Syringa villosa*, are blooming rather more freely this year than before, although the Arboretum plants may be expected to be more prolific as they grow older. *Syringa reflexa* is a conspicuous plant at this season of the year, for unlike those of all other Lilacs the flower-clusters are gracefully arching and pendent on long stems; they are cylindric, very compact, unbranched, and rarely more than an inch and a quarter in diameter. The flowers are deep rose color with a long slender tube and the odor of those of *S. villosa*. In habit *Syringa Sargentiana* resembles *S. reflexa*, but differs from that species in the large, long-branched flower-clusters which are erect, spreading or nodding, and sometimes eighteen inches long and twelve inches across. The flowers are rather paler in color than those of *S. reflexa* and white on the inner surface

of the corolla lobes. *Syringa Koehneana* is as usual flowering very sparingly, and it is doubtful if this Korean shrub will have much value as a garden plant in this climate. It is a vigorous, irregularly growing plant with large leaves and short, broad, compact clusters of rose-colored flowers white on the inner surface of the corolla lobes.

**Tree Lilacs.** The Lilac season closes with the flowering of these eastern Asiatic species which are popularly known as "Tree Lilacs." They all have handsome dark green leaves which fall in the autumn without change of color, and large usually unsymmetrical clusters of white flowers with the disagreeable odor of the flowers of the Privet. They are handsome and hardy plants and when in bloom the most conspicuous of the trees or large arborescent shrubs of their season. This year, the three species promise an unusually abundant bloom. The first of these plants to flower, *Syringa amurensis*, is a native of eastern Siberia, and a shrub twelve or fifteen feet high, with dark-colored bark, leaves pale on the lower surface, and short unsymmetrical flower-clusters which usually are produced only on alternate years. *Syringa pekinensis* blooms soon after *S. amurensis*. It is a native of northern China and a shrub sometimes thirty feet tall and broad, with stout spreading stems covered with yellow-brown bark separating into thin plate-like scales like that of some Birch-trees, narrow, long-pointed leaves, and short, unsymmetrical flower-clusters, usually in pairs. This species retains its leaves later in the autumn than the other "Tree Lilacs," and it flowers profusely every year. The last of these plants to flower, *Syringa japonica*, is a native of northern Japan and a tree sometimes forty feet high, with a tall straight trunk covered with lustrous brown bark like that of a Cherry-tree, a round-topped head of erect branches, broad thick leaves and mostly symmetrical flower-clusters often eighteen inches in length. This tree rarely flowers except in alternate years.

**Berberis Vernae.** Gardeners often complain that there are now too many Barberries, and it is certainly true that only an expert who has devoted years of special study to the genus can readily distinguish all the species, varieties and hybrids in the groups of which *Berberis vulgaris*, the common Barberry of western Europe, and now naturalized in the northeastern United States, is a typical plant. There are now probably at least one hundred different Barberries in the Arboretum Collection and the number is likely to increase rather than to decrease, for Barberries hybridize easily in collections like the one in the Arboretum, and it is more than probable that China, the headquarters of the genus, may still contain undescribed species. There may be too many Barberries but no one who has once seen *Berberis Vernae* as it is now growing in the Arboretum will regret that Wilson, who discovered this plant in China, sent seeds to the Arboretum in 1910 from the neighborhood of Sungtan in the upper Min Valley where he found it at an altitude of about nine thousand feet above sea-level, growing with the other Chinese Barberries. *B. Vernae* is here now about six feet tall and nearly as much in diameter. The long, slender, bright red branches covered with small, nearly entire leaves arch and droop gracefully, and from them hang on long stems innumerable slender clusters of small, pale yellow, slightly fragrant flowers which in the autumn are followed

by small red fruits. A green fountain best describes this shrub. There are Barberries with larger and handsomer leaves, larger flowers and more brilliant fruit, but there is not one in this collection, at least, of such graceful habit; and *Berberis Vernae* as it grows here is not only one of the most beautiful of the deciduous-leaved species of the genus but one of the handsomest of the shrubs discovered in China during the present century which can be successfully grown in this climate. Plants of *Berberis Vernae* raised from seed collected by William Purdom in Min-chou in western Kansu, received at the Arboretum in 1912, are also well established here.

*Neillia sinensis*, uninjured by the severe winter, has been as beautiful as usual this month. The flowers are cylindric, clear pale pink, nearly half an inch long and are pendent on slender stems in long one-sided racemes terminal on short lateral branchlets, and do not open until the dark green leaves have grown to nearly their full size. This is one of the Chinese shrubs which seems destined to become popular in northern gardens. Several other species of *Neillia* are growing in the Arboretum; they are either not hardy enough to flower or their flowers are insignificant.

*Kolkwitzia amabilis* on the southern slope of Bussey Hill has not before flowered so profusely as it has during the past week. It is the only representative of a genus of western China related to *Diervilla* and *Abelia*. The flowers are in pairs on long stems at the end of short lateral branchlets, and rose color in the bud become paler after opening and are blotched with yellow at the base of the inner surface of the divisions of the lower lobe of the corolla. *Kolkwitzia* has not yet produced seeds in the Arboretum, and this interesting and beautiful shrub is still rare in American gardens.

*Aesculus discolor* var. *mollis*. This shrub or small tree has not before flowered so freely in the Arboretum. The type of the species has red and yellow flowers, but in the var. *mollis*, which is the only form in the Arboretum, the whole flower is bright scarlet. It is a common plant from northern Georgia to central Alabama and westward to the valley of the Guadalupe River in Texas, ranging west of the Mississippi River northward to southeastern Missouri, and appearing in southwestern Tennessee. In early spring no other plant in the southern states is more brilliantly conspicuous, and its unexpected hardiness in New England is one of the important discoveries made by the Arboretum in recent years. There is a form of *Aesculus discolor* (var. *flavescens*) with yellow flowers which is confined to the Edwards Plateau in western Texas. It is possible that this plant may also prove hardy here. *Aesculus Harbisonii*, which is believed to be a hybrid of *A. discolor* var. *mollis* and *A. georgiana*, is the last of the Buckeyes, with the exception of *A. parviflora*, to bloom in the Arboretum. It is a shrub with broad clusters of large flowers with a rose-colored calyx and canary yellow petals tinged with rose toward the margin. Still extremely rare, this hybrid which is perfectly hardy deserves to be better known.



ARNOLD ARBORETUM  
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**Philadelphus.** Many additions have been made in recent years to this genus by travellers in eastern Asia and by the labors of the plant-breeder, and it now constitutes one of the largest and most important groups of garden shrubs hardy in the northern states, and to be ranked with the Lilacs, Bush Honeysuckles, Viburnums, Azaleas and Cornels. The popular names of these plants, Syringa and Mock Orange, are unfortunate for Syringa is the Latin name of the Lilacs and Mock Orange, given to them no doubt on account of the perfume of the flowers of *Philadelphus coronarius* of southeastern Europe which for many years was the only one of these plants to be found in gardens, does not describe the flowers of all the species for many of them are entirely destitute of odor; and Mock Orange, too, is the common name of *Prunus caroliniana*, the Evergreen Cherry-tree of the southern states which is much planted there and largely used as a hedge plant. Species of *Philadelphus* are native in the United States in the southern Appalachian Mountain region, in western Arkansas, western Texas, in the southern Rocky Mountains of New Mexico and Colorado, and in the northwestern states; many species have been found in Japan, Korea and western China; and the genus is represented on the Himalayas, the Caucasus, and in the Balkan Peninsula. The plants of this genus are not particularly interesting in habit; the leaves are dull and fall without change of color, and the fruit, which is a dry capsule, does not add to the attractiveness of these plants, which is to be found only in their abundant white, often fragrant flowers. The flowering period of the thirty odd species, with many hybrids and varieties in the Arboretum collection extends through five or six weeks and most of the plants flower freely every year. They need rich, well-drained soil, and the presence of lime in it has no bad effect on these plants. Better

than most shrubs they can support shade, and their ability to grow and flower under trees gives them a special value for the undergrowth of border plantations.

It is unfortunate that the type of the genus and the only species in the gardens of the eighteenth century, *Philadelphus coronarius*, is now so rarely found in any but the really old-fashioned gardens of New England, for it is a delightful plant and the flowers of no other *Philadelphus* are more pleasantly fragrant. There are in the Arboretum collection varieties of this plant with double flowers of which the var. *deutziaeflorus*, with narrow petals, is the handsomest; a variety with narrow leaves (var. *salicifolia*) is more curious than beautiful, and a dwarf compact form which never flowers, and one with yellow leaves, are more interesting to those who like monstrosities than to the lovers of beautiful plants. Among American species the handsomest are *Philadelphus inodorus*, *P. pubescens* and *P. microphyllus*. The first of these is by some persons considered the handsomest of the *Syringas* in the Arboretum collection. It is a species of the southern Appalachian region and a shrub six or seven feet tall, with gracefully arching branches which are studded from end to end with large, cup-shaped, snow white, scentless flowers. Although this shrub was sent to England more than a hundred years ago, it appears to be still rare in American and European gardens. *Philadelphus pubescens*, perhaps better known in gardens as *P. latifolius* and *P. grandiflorus*, grows in the same region as *P. inodorus*; they are larger plants sometimes twenty feet tall with stout erect stems and branches, and broad dark green leaves. *Philadelphus pubescens*, *P. grandiflorus* and some of their hybrids are common garden plants in this country. The most important and distinct of these hybrids is *Philadelphus splendens* which appeared in the Arboretum several years ago, and its parents are believed to be *P. grandiflorus* and *P. Gordonianus*. It is a tall, broad, shapely shrub with pure white, slightly fragrant flowers borne in clusters and an inch and three-quarters in diameter. This plant when in bloom makes a more conspicuous display than any *Philadelphus* in the collection. The Rocky Mountain *P. microphyllus* is far removed in general aspect from the Appalachian species for it has the smallest leaves and flowers of any plant in this group. It is a shrub with slender stems, and here in the Arboretum has not grown more than three feet tall; perfectly hardy for many years, it has suffered considerably in the two cold winters of recent years. The Arboretum plants are, however, recovering. For a long distance the air is filled with the perfume of the flowers of this little shrub, which is stronger and more aromatic than that of any other *Philadelphus*.

Perhaps the handsomest and certainly the most distinct of the Asiatic species is *Philadelphus purpurascens*, one of Wilson's discoveries in western China. It is a vigorous shrub, with long arching branches from which spring numerous laterals from four to six inches in length; these branchlets spread at right angles to the stem and on these the fragrant flowers are pendent on drooping stalks. The bright purple calyx of the flowers makes a handsome contrast with the pure white petals which do not spread as in most species but form a bell-shaped corolla. One of the handsomest of the shrubs recently introduced from

China *Philadelphus purpurascens* deserves more general propagation in this country. Another Chinese Syringa, *Philadelphus Magdalenæ*, well deserves a place in American gardens. It is a tall broad shrub with arching stems, small dark green leaves, and pure white fragrant flowers an inch and a quarter in diameter and arranged in drooping, leafy, many-flowered clusters from six to ten inches in length. *Philadelphus pekinensis*, a native of northern China and Mongolia, which has been growing in the Arboretum since 1883, has proved an excellent garden plant. The flowers are not as large as those of many of the other species and are slightly tinged with cream color, but they are produced in immense numbers. This is a compact shrub with slender erect stems three or four feet tall, and usually broader than high.

**Hybrid Philadelphus.** The importance of *Philadelphus splendens* as a garden plant has already been mentioned. Another hybrid of rather uncertain parentage, known now as *Philadelphus speciosus* and formerly as "Monsieur Billard," originated many years ago in France is a handsome plant which, blooming later than other Syringas, prolongs the flowering period of this group until the middle of July. These early hybrids were the result of natural cross fertilization, and the systematic breeding in this genus dates from the time when Lemoine of Nancy in France first crossed the Rocky Mountain *P. microphyllus* with *P. coronarius* and produced the plant to which he gave the name of *P. Lemoinei*. Lemoine then crossed his *P. Lemoinei* with the hybrid *P. insignis* and produced a race of beautiful plants to which the general name *Philadelphus polyanthus* has now been given. Well known forms of this hybrid are "Gerbe de Neige" and "Parvillon Blanc." To another race of the Lemoine hybrids the name of *Philadelphus cymosus* has been given. This was obtained by crossing *P. Lemoinei* with *P. grandiflorus* or some related species. "Conquête" is considered the type of this group; other well known plants which are believed to belong here are "Mer de Glace," "Norma," "Nuée Blanche," "Rosace," "Voie Lactée," and "Perle Blanche." To another race of hybrids with double racemose flowers, raised by Lemoine and of doubtful origin, the name *Philadelphus virginialis* has been given. The type of this group is his "Virginal;" other plants referred to it are "Argentine," "Glacier," and "Bouquet Blanc." The introduction of *Philadelphus microphyllus* into France, where it was sent by the Arboretum in 1877 or 1878, made possible in the hands of Lemoine the production of these races of beautiful plants which are some of the important contributions made to northern gardens in the last thirty years.

**Late-flowering Viburnums.** The Arboretum late in June owes much of its beauty to the late-flowering Viburnums of the northeastern states which have been planted here in considerable numbers. The first of these plants to bloom and the handsomest of them, *Viburnum cassinoides*, although it grows naturally in cold northern swamps, takes kindly to cultivation, and in ordinary garden soil is a handsomer and more shapely plant than it is in its natural home where it often makes slender straggling stems fifteen or twenty feet tall. The beauty of this Viburnum is in its ample, thick and lustrous leaves which vary in shape and size on different plants, in its broad convex clusters of pale cream-colored flowers and in its large showy fruit which when fully

grown is yellow, then pink, and finally blue-black, the three colors often appearing at the same time in the same cluster. The fruit of *Viburnum cassinoides* is larger than the bright blue fruit of the other summer-flowering species, *V. dentatum*, *V. venosum* and *V. Canbyi* which bloom in the order in which they are mentioned here. They are large round-topped bushes with coarsely toothed leaves and large clusters of white flowers; they are all good garden plants and respond to generous treatment with more vigorous growth, a better habit and handsomer foliage. There is a large collection of deciduous-leaved Viburnums in the Arboretum and there is now a good opportunity here to judge the comparative values of the plants from different countries, and this comparison shows that the flora of eastern North America contains more handsome garden plants in this genus than all the rest of the world. In Japan there are species like *Viburnum tomentosum*, *V. Sieboldii* and *V. dilatatum* which are beautiful garden plants, and the European Traveler's Tree, *V. lantana*, is one of the handsomest and most distinct of the early-flowering Viburnums which can be successfully grown here. In claiming the superiority of the American species for American gardens it must be remembered that none of these species have red fruit, which is produced by several of the eastern Asiatic species. The most successful of the red-fruited species in the Arboretum have been *V. dilatatum* and *V. Wrightii*. These should find a place in American collections, especially the former which is here a hardy, free-flowering plant of compact habit, which has few rivals in the beauty of its brilliant and abundant bright red fruit.

**Cornus kousa.** The flower-buds of the native *Cornus florida* were practically all killed by the cold of the past winter except those on lower branches which had been buried in snow. It is interesting to find, therefore, that the flower-buds of the related species from eastern Asia, *Cornus kousa*, were not injured and that the Arboretum plants have not before been more fully covered with flowers. The form from western China discovered by Wilson, which has before bloomed only sparsely in the Arboretum, is this year white with the bracts of the flower-clusters. The flower-bracts of the Chinese plant are broader and closer together than those of the Japanese plant and it promises to be more valuable here for garden and park decoration. The flower-bracts, however, of both forms of the Asiatic plant are pointed, making a star-like inflorescence, and are much narrower than those of *Cornus florida* which is still the handsomest of the "Flowering Dogwoods" which can be grown in Massachusetts.

**Rhododendron (Azalea) calendulaceum.** The plants of the flame-colored Appalachian Azalea on Azalea Path furnish this week the most brilliant display in the Arboretum. No other Azalea which can grow in the open ground in this climate equals this in beauty with the exception, perhaps, of the pink-flowered *R. Vaseyi* which blooms before its leaves appear. On *R. calendulaceum* and the other late-blooming American species a beauty of the flowers due to their contrast with the well grown leaves is not found on *R. Vaseyi* or on any of the Asiatic Azaleas which can be grown in the northern states.

**Philadelphus splendens** was inadvertently omitted from the list of Arboretum hybrids printed on page 31 of these Bulletins for the current year.

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**Lindens.** So far as flowers are concerned the interesting trees in the Arboretum in July are the Lindens of which there is a large and well established collection in the meadow on the right-hand side of the Meadow Road. Linden-trees are found in eastern North America, eastern Asia, the Caucasus, and in Europe, and the species are usually widely distributed and common forest trees. All the species are quite similar in the character of their flowers and fruit, and chiefly differ in the shape of their leaves, in the presence or absence of hairs on the leaves and branchlets and in the nature of this hairy covering when it exists. A curious fact about Linden-trees is that in the flowers of the American species there are five petal-like scales opposite the petals and connected with the clusters of stamens, and that in the flowers of the Old World Linden-trees these petal-like scales do not occur. Another interesting fact which has been learned here about Linden-trees is that in the Arboretum the European species and their hybrids are more vigorous and handsomer trees than the Asiatic species, although with few other exceptions eastern Asiatic trees give more satisfaction in eastern North America than the trees of western Europe. The European Lindens, too, grow more rapidly than the American species which have never been very generally planted in this part of the country, with the exception perhaps of the northern *Tilia glabra* which often suffers here in dry summers from the attacks of the red spider which disfigures and often causes the leaves to fall in August, especially when it is planted as a street tree. This tree usually appears in books under the incorrect name of *Tilia americana*. It is a splendid tree in the forests of northern New England and eastern Canada, where it is found from northern New Brunswick to the shores of Lake Winnipeg, and is less common and of smaller size southward. The leaves are destitute of

hairs with the exception of the large conspicuous tufts in the axils of the veins on their lower surface which is light green and lustrous. Three other American species are established in the Arboretum, *Tilia neglecta*, *T. heterophylla* var. *Michauxii* and *T. monticola*. The first of these trees differs from *Tilia glabra* in the short, gray, finely attached pubescence which covers the lower surface of the leaves during the season and in the small inconspicuous tufts of axillary hairs. This is also a common northern tree which often grows with *Tilia glabra* and has usually been confused with it in books on American trees. It has a wide range from the valley of the St. Lawrence River in the Province of Quebec through the northern states, ranging southward along the Appalachian Mountains to North Carolina and westward to southwestern Missouri. This tree, which has not been many years in the Arboretum, has so far escaped the attacks of the red spider, and has grown rapidly and proved to be a good tree here. *Tilia heterophylla* var. *Michauxii* is a northern variety of a species widely distributed in the southeastern states. It differs from *Tilia glabra* and *T. neglecta* in the thick white down or tomentum which covers the lower surface of the leaves during the season and on the leaves of upper branches is often brown. This is a handsome tree with slender, reddish or yellowish brown branchlets and small, slightly flattened winter-buds. It occurs in western New York and is widely distributed southward from the valley of the Susquehanna and the lower Ohio Rivers, in the southern states being usually confined to the slopes of the Appalachian Mountains and their foothills. This tree is hardy in the Arboretum where it has grown more slowly than *Tilia neglecta* and *T. monticola*. This last is the most conspicuous of the American Lindens which have been satisfactorily tested in the Arboretum. It is the tree which has been incorrectly called *Tilia heterophylla* in most books in which American trees have been discussed. It is found only on the slopes of the southern Appalachian Mountains from Virginia to North Carolina and eastern Tennessee, growing with *Tilia heterophylla* var. *Michauxii*. From that species it differs in its much stouter branchlets, much larger compressed winter-buds, larger leaves very oblique at the base, often seven or eight inches long, thickly covered below with white tomentum and hanging on long slender stalks. The flowers are larger than those of any other American Linden. This Linden has grown more rapidly in the Arboretum than *Tilia heterophylla* var. *Michauxii* and promises to be a valuable tree in northern parks. There are three Linden-trees in eastern Europe, *Tilia platyphyllos*, *T. cordata* and *T. vulgaris*. The first has yellowish green leaves covered on the lower surface with soft hairs which also cover the young branchlets. This is the first of the European Linden-trees to bloom in the Arboretum where it is growing with several of its abnormal varieties, including one with deeply divided leaves (var. *asplenifolia*), one with slightly lobed leaves (var. *vitifolia*), and another of pyramidal habit (var. *pyramidalis*). These varieties are curious rather than beautiful, and have little to recommend them as ornamental trees. *Tilia platyphyllos* appears to be the common Linden sold by American nurserymen as "European Linden." It is perfectly hardy but as an ornamental plant it is the least desirable here of the European Lindens. Much handsomer is the small-leaved Linden, *Tilia cordata*, which is the last of the Lindens in the collection

to open its flower-buds. The leaves are often broader than long, with a heart-shaped base, very dark green above and pale below, and rarely more than two and a half inches in length. This tree has grown slowly here and is still a broad-based, densely branched pyramid. It is not common in American plantations, and the Arboretum has not heard of any large trees in the United States. In central and northern Europe trees a hundred feet tall, however, are not uncommon. The third of the Lindens of western Europe, *Tilia vulgaris*, is believed to be a natural hybrid between *Tilia platyphyllos* and *T. cordata*. It is a large tree with leaves dull green on the upper surface, lighter on the lower surface and destitute of hairs except in the axils of the veins below; in the Arboretum it flowers a week or ten days later than *Tilia platyphyllos*. There are fine old specimens of this tree in the neighborhood of Boston, and it is the best of all Lindens in this climate to shade city streets. It is this tree which has been successfully used in Boston on Louis Pasteur Avenue which connects the Harvard Medical School with Audubon Road.

The two silver-leaved Lindens of eastern Europe, *Tilia tomentosa* (sometimes called *T. argentea*) and *T. petiolaris*, are handsome trees of unusual appearance which might well be more often seen in American plantations. *Tilia tomentosa*, which is a common tree in the forests of Hungary, is a large tree with erect branches which in this country form a broad, compact, round-topped head, and large, erect leaves, dark green above and snowy white below. This tree has been a good deal planted in the parks of New York City where large and handsome specimens can now be seen. It appears to be less well known in New England. *Tilia petiolaris* is a handsomer tree and one of the most beautiful of the exotic trees which can be successfully grown in this climate, as can be seen in Newport, Rhode Island, where there are many noble specimens. It is a tall tree with drooping branches which form a narrow head, and leaves which are silvery white on the lower surface and, drooping on long slender stalks, flutter gracefully in the slightest breeze. This tree is not known in a wild state and its origin is uncertain. *Tilia spectabilis*, which is believed to be a hybrid of *T. petiolaris* or *T. tomentosa* with *T. glabra*, is a handsome fast-growing tree with the large leaves of the American species and silvery white on the lower surface. This is one of the handsomest Lindens in the Arboretum collection. The var. *Moltkei* of this hybrid is a tree of denser habit and greener leaves, and in this climate a handsomer and more desirable tree than *T. glabra*. It originated many years ago in the Spaeth Nursery near Berlin. The Crimean Linden (*Tilia euchlora*, sometimes called *T. dasystyla*) is distinct in its dark green lustrous leaves, and is believed to be a hybrid between *Tilia caucasica* and *T. cordata*. This beautiful tree is hardy in the Arboretum, but it does not grow as well here as the European species and certainly not as well as it does in some of the countries of western Europe where it has been used and is recommended as a street tree. *Tilia caucasica*, one of its supposed parents, is not in the Arboretum collection.

Asiatic Lindens have not yet given much promise of growing here into large or handsome trees. Nearly every species from eastern Asia which has been described has been planted in the Arboretum more than

once and most of them are still growing here. They are all quite small with the exception of *Tilia japonica* which was raised at the Arboretum from seeds collected in Japan by Professor Sargent in 1892. It is a small tree here with leaves very similar to those of *Tilia cordata*, of which it has sometimes been considered a variety. The Japanese tree is chiefly interesting as the first of all the Lindens here to unfold its leaves in the spring. When Lindens bloom is a happy time for bees, for the flowers of all Linden-trees contain large quantities of nectar. Unfortunately that of *Tilia tomentosa* and *T. petiolaris* is poisonous.

**Tripterygium Regelii.** Climbing plants with handsome foliage and a conspicuous inflorescence easy to grow and hardy in New England are not too numerous, and Mr. Jack's introduction several years ago from Korea of *Tripterygium Regelii* made an important addition to the number. It is a near relative of the Bitter Sweets (*Celastrus*) and a native of Korea and northern Japan, where it rambles over rocks and bushes, and often climbs with stems fifty or sixty feet long into the tops of trees. The leaves are long-pointed, dark green, and often six inches in length. The small white flowers are produced in narrow open clusters ten or twelve inches long, and they are followed by showy, three-lobed, and three-winged fruits from half an inch to an inch long. By pinching the young shoots this vine can be grown as a shrub. Such a plant is now growing and flowering in the Shrub Collection, where it is also growing naturally on the trellis next to the different species of *Celastrus*.

**Periploca sepium.** This is another handsome twining plant which the Arboretum owes to the labors of Mr. Jack in Korea. It is growing on the trellis near the *Tripterygium* and is unusually full of flowers this year. It is a plant with slender stems, pointed dark green and very lustrous leaves about three and a half inches in length and not much more than half an inch in width, and small flowers in few-flowered clusters. The flowers do not make much show when seen from a distance, but on close examination show that they are green on the outside, dark purple with a five-lobed crown at the base on the inside, and that they are pleasantly fragrant. The plants in the Arboretum have not yet produced their slender pod-like fruits, but as they send up numerous root suckers this vine can be easily propagated and might soon become common in northern gardens. Much better known is *Periploca graeca* from southern Europe and western Asia which has not yet proved hardy in the Arboretum.

**Lonicera prostrata.** The attention of persons looking for plants suitable for ground cover is directed to this Honeysuckle discovered by Wilson near Sungpan in Szech'uan, western China, at an altitude of about twelve thousand feet above sea-level. It has long slender branches which lie flat on the ground, so that the plant is only a few inches high, small bluish green leaves, small inconspicuous yellow flowers and small red fruit. As a garden plant this Honeysuckle has nothing to commend it but its habit which should make it useful to cover the ground among large shrubs and on the borders of shrubberies. *Lonicera prostrata* is growing on the southern slope of Bussey Hill with the other new Chinese shrubs.



ARNOLD ARBORETUM  
HARVARD UNIVERSITYBULLETIN  
OF  
POPULAR INFORMATION

JAMAICA PLAIN, MASS.

JULY 9, 1920

**Pterocarya** is a genus of trees of the Walnut Family, differing from the Walnuts and Hickories in its small winged nut arranged on a long pendulous raceme and smooth bark. It has the long pinnate leaves of the other members of its Family and pith like that of the Walnuts, in thin plates, not solid like the pith in branches of Hickory-trees. The genus is a small one and grows naturally only in the Caucasus, central and southern China and in Japan. The Caucasian species, *Pterocarya fraxinifolia*, was the first of these trees planted in western Europe and the United States, it having been brought to Europe from Persia in 1782 by the French traveller Michaux whose name is a household word with students of the American flora. This tree appears to have been first planted in the United States at the beginning of the nineteenth century at the Woodlands in West Philadelphia, the famous Hamilton garden where it is believed that the Lombardy Poplar was first planted in the United States. Three of these trees were growing at Woodlands, at that time a cemetery, thirty years ago. They had not grown to a large size but were in good health; it is reported that these trees have now disappeared. There in an old specimen of this tree in the Harvard Botanic Garden at Cambridge which possibly was planted when this garden was laid out more than a century ago. This tree is hardy and is perhaps the oldest and largest specimen in the United States, but it is not a handsome tree and has never looked as if its surroundings agreed with it. The Caucasian *Pterocarya* has been a difficult tree to establish in the Arboretum, and there is only a young specimen here which does not give much promise of becoming a tree. The climate of England, France and Italy suits this tree much better than that of the northeastern United States; and several specimens

eighty or ninety feet high with tall massive trunks can be seen in those countries. The best known of the Chinese species, *Pterocarya stenoptera*, is a common tree in the central and southern provinces of China, ranging southward into Tonking. It inhabits plains and low hills in the neighborhood of streams and is said to be always a small tree. This tree was first planted in Europe in 1860 in the Arboretum Segrezianum; it lived there for several years but was killed by the severe winter of 1879-80. In the Arboretum the roots live but the stems are killed back to the ground or nearly to the ground every winter. This tree would probably grow well in California or in some of the southern states, but its only interest in the north is in the fact that crossed with the Caucasian species it has produced a natural hybrid to which the name *Pterocarya Rehderiana* has been given. This is a beautiful, fast-growing tree with characters intermediate between those of its parents, which it surpasses in hardiness and vigor. The small grove of these trees under which at one place Hickory Path passes is one of the interesting groups in the Arboretum. These trees flower and produce fruit every year and send up also many suckers from the roots by which they can be easily multiplied. The two or three other Chinese species of *Pterocarya* have not yet been cultivated long enough to make it possible to form any opinion of their value in this climate. Judging by our present knowledge, it is to Japan that we must look for the best *Pterocarya* for general planting. The Japanese species *P. rhoifolia* has been growing in the Arboretum since 1893 when it was raised here from seed collected by Professor Sargent in Japan. He first met with it on the lower margin of the Hemlock-forest (*Tsuga diversifolia*) which covers the slopes about Lake Umoto among the Nikko Mountains. Here the *Pterocarya* was a small tree; on the slopes of Mount Hakkoda in the extreme northern part of Hondo he found the *Pterocarya* extremely common at altitudes between 2500 and 4000 feet above the sea level and next to the Beech the largest tree of the region. Trees eighty feet high with a tall straight trunk two and a half feet in diameter and stout branches spreading at nearly right angles and forming a massive crown of dark green foliage were common. The leaves are eight or ten inches long and from four to six inches wide, with stout hairy petioles and six or seven pairs of lateral leaflets which are acute, unequally rounded at base, long-pointed, and finely toothed on the margins; in October they turn clear yellow before falling. The terminal winter-buds well distinguish this species; they are conical with a curved beak and when first formed are covered with a thin sheath composed of two external and usually two internal glabrous glandular scales; these fall off late in the autumn, leaving scars at the base of the bud which is thickly covered with pale pubescence. In the Arboretum *Pterocarya rhoifolia* has proved to be one of the handsomest and hardiest of the trees of eastern Asia which have been planted here; it has grown up with a clear straight trunk and its lustrous dark green leaves have not yet been injured by insects or disease. It will certainly be a good subject for park plantations; and it is not improbable that it will prove useful for shading city streets. It should certainly be tried for this purpose. *Pterocarya rhoifolia* is a rare tree in the United States and Europe. During the last two years,

however, the Arboretum has succeeded in obtaining a supply of the seeds from Japan, and as these have been widely distributed it will now perhaps soon become better known.

**Crataegus Phaenopyrum** or **cordata** is in flower this week. Hawthorns begin to flower in the Arboretum before the first of May and they have been flowering here almost continuously ever since. In a month some of the species will begin to ripen their fruit, and on others fruit little shrivelled or discolored by the winter will still be on the branches in April. There are not therefore many weeks in the year in which Hawthorns in this climate cannot furnish either flowers or fruit. In the tropics some trees produce flowers almost continuously during the year, but in cold countries like New England no other group of plants has such a long season of flowers except the Viburnums, and none of the Viburnums retain their fruit into the winter. When in bloom some of the American Hawthorns are objects of great beauty, and only the fruit of some Crabapples is more conspicuous than that of the large-fruited Hawthorns. As they grow naturally over a large part of eastern North America and more sparingly in the west there are few parts of this country or Canada where some of the species cannot be successfully grown. All the Thorns thrive in cultivation and respond to a generous treatment with larger size, more tree-like habit and handsomer foliage and fruit. *Crataegus Phaenopyrum*, which appears at the head of this paragraph, the Washington Thorn, cultivated perhaps more frequently seventy-five years ago than at present, is a slender tree growing under favorable conditions to a height of twenty-five or thirty feet; the leaves are nearly triangular in shape, not more than two inches long and an inch and a half wide, and are dull green; in the autumn they turn bright scarlet. The flowers are creamy white, smaller than those of most Hawthorns, and are arranged in small compact clusters. Few if any of the American species have less attractive flowers. The fruit, too, is small, barely more than a quarter of an inch in diameter; and the Washington Thorn owes its value as a garden plant to the brilliancy of its autumn foliage and to the beauty of its abundant fruits long persistent on the branches. In earlier days of American gardens *Crataegus Phaenopyrum* was much used as a hedge plant in the middle states, although there are many other American Hawthorns which seem much better suited to form handsome and impassable hedges.

**The last Viburnums.** The first Viburnum, *V. alnifolium*, was in bloom the first of May, and this week the last Viburnum, another American species, *V. Canbyi*, has just opened its flowers, and during more than two months there has not been a day when a Viburnum has not flowered in the Arboretum. *V. Canbyi* is the largest and the handsomest of the blue-fruited species of eastern North America, of which the best known now in gardens is *V. dentatum*. There are three species in this group; they all have broad, coarsely toothed, dark green shining leaves, wide, flat clusters of white flowers and small blue fruits. The first to flower, *Viburnum dentatum*, is followed by *V. venosum* which differs from it chiefly in the hairs which cover the young branchlets and the lower surface of the leaves. This is a sea coast plant and

grows only from the southern side of Cape Cod to New Jersey. Its flowers are followed by those of *V. Canbyi* which is the largest and handsomest of this group of Viburnums, and one of the handsomest of the summer-flowering shrubs in the Arboretum, where it is represented by round-topped plants some twelve feet high and broad. By some botanists this shrub is considered a variety of *V. venosum* which it resembles, but the leaves and flower-clusters are larger; it blooms ten or twelve days later, and the flowers and fruits are larger. Its home, too, is not on the seashore but in northern Delaware and the adjacent parts of Pennsylvania, and in central Indiana. This Viburnum reproduces itself from seeds and there is therefore no reason why it should have remained so rare in gardens.

*Zenobia pulverulenta* has not before been so thickly covered with flowers and this week has been the most beautiful shrub in the Arboretum. *Zenobia* is related to the *Andromedas* and is chiefly distinguished by its open campanulate flowers and four-awned anthers. The leaves are thickly covered with a glaucous bloom, and the ivory white flowers, which are about half an inch long and broad, are borne on slender arching stems in axillary clusters forming long terminal racemes on the upper part of the branches of the previous year. There is a form of this shrub (var. *nitida*) with leaves green on the two surfaces. *Zenobia* is a southern genus with one species, and the fact that it is hardy in New England shows that only experiment will show whether a plant is hardy in any given locality remote from its natural habitat. The green-leaved variety grows in countless thousands along the borders of the great swamp across the river from New Berne on the coast of North Carolina. The white-leaved form, which was found by William Bartram on the lower Cape Fear River in North Carolina, appears to be less common and apparently has not been collected in recent years; that is the two forms of this plant grow in a region which could not be expected to produce plants hardy in Massachusetts.

*Evonymus radicans* is the only evergreen climbing plant really hardy in this climate which can attach itself firmly to stone, brick or concrete walls. There are a number of varieties of this variable plant in cultivation, and the handsomest of them is the broad-leaved form from northern Japan, known as var. *vegetus*. This plant can grow in Massachusetts to the eaves of a tall house and completely clothe its walls with a cover which grows thicker by an annual shortening of the branches, or if a wall is not provided for it to cling to it will grow as a low round-topped dense shrub. Like the other forms of the species it can also be used to cover the ground under trees and shrubs, but as a ground cover it is improved by occasional clipping. This variety *vegetus* is now covered with its small yellow-green flowers which will be followed by abundant pink fruit, which adds greatly to the decorative value of this variety which is the only form of *E. radicans* which has flowered in the Arboretum. The extreme cold of two recent winters injured the leaves on many plants of this var. *vegetus* in eastern Massachusetts, but the wood was not hurt and the branches were soon covered with a new crop of leaves.

## ARNOLD ARBORETUM

HARVARD UNIVERSITY

BULLETIN  
OF  
POPULAR INFORMATION

JAMAICA PLAIN, MASS.

JULY 15, 1920

**Catalpas** are trees of the Bignonia Family and grow naturally only in eastern North America, the West Indies and northern and central China. They all have large simple leaves, and large terminal clusters of two-lipped flowers followed by long slender pods containing many thin seeds furnished at the ends with long tufts of pale hairs. All the Catalpas and one or two of their hybrids are growing in the Arboretum with the exception of the species from the West Indies. The first Catalpa, *C. bignonioides*, which attracted the attention of botanists and gardeners was sent from South Carolina to England early in the eighteenth century. This for a long time was the only American species cultivated in Europe or the United States, but forty or fifty years ago it became known that another species grew in the valley of the Ohio River and southward along the Mississippi River as far south as western Tennessee and northeastern Arkansas. To this Catalpa the name *speciosa* has been well given as it is now known to be the largest, the fastest growing, the hardiest and the handsomest of all Catalpa-trees. It is the earliest of all the species, too, to bloom, and it is now covered with flowers which are larger than those of the other species. On the rich alluvial bottom lands of the Mississippi River this tree has often grown to the height of one hundred and twenty feet and formed a trunk four and a half feet in diameter. In New England it will never grow to that size, but although it was introduced into the eastern states less than fifty years ago trees in eastern Massachusetts are already fully forty feet high and have been flowering and ripening their seeds for many years. Catalpas produce soft wood which is remarkably durable when it comes in contact with the soil, and in some of the middle western states large plantings of *Catalpa speciosa* have been made to supply fence-posts, for which the wood is admirably

suited, and for railway ties for which it has proved too soft. The other American species, *Catalpa bignonioides*, probably originated somewhere in the southeastern part of the country, but it has been so spread by escapes from planted trees that it is no longer possible to determine the location of its first home. It was for many years one of the common planted trees in the middle and southern states, and specimens are still occasionally seen in southern New England. Now, however, when one wants to plant a Catalpa-tree in this country he finds in nurseries only *C. speciosa*. The more southern species is a smaller tree with shorter-pointed leaves; it grows less rapidly and blooms two or three weeks later than the eastern species. The flowers are smaller, in shorter and more compact clusters, and the pods are smaller with thicker walls. There is a dwarf form of *Catalpa bignonioides* (var. *nana*) which grafted on the stem of one of the tree Catalpas has in recent years been largely planted in this country for the supposed decoration of gardens which are more or less formal in character. It is not known where the dwarf plant originated, and if it has ever flowered the fact is not known at the Arboretum. The fact that it is universally sold in American nurseries under the name of *Catalpa Bungei* causes confusion for that name properly belongs to a tree from northern China. This Chinese tree has narrow, long-pointed dark green leaves, small yellowish flowers and small pods. It has been growing in the Arboretum since 1904, and was perfectly hardy until the winter of 1916-17 when one of the trees was killed to the ground and others were more or less injured. They have now recovered, but this Catalpa has not yet flowered in the Arboretum. Compared with the American species it has no value as an ornamental tree. Another Chinese species, *Catalpa ovata*, was sent many years ago to this country from Japan where it has long been cultivated. It is a small tree with comparatively small, dark green leaves, many-flowered clusters of small, yellowish spotted flowers, and slender pods. This tree, which will grow in regions too cold for the American species, has been somewhat planted in the United States, although as an ornamental tree it does not have much to recommend it. In this country it has proved most valuable as one of the parents of the natural hybrid, *Catalpa hybrida*, which appeared several years ago in the Teas Nursery at Baysville, Indiana, and is often called *C. Teasii* and "Teas' Hybrid Catalpa." This is a fast-growing and hardy tree with flowers like those of *C. bignonioides*, the American parent, although smaller but in larger clusters, and leaves in shape resembling those of *C. ovata*. The two species introduced by Wilson from central China, *Catalpa Duclouxii* and *C. Fargesii*, are still living but give little promise of ever becoming valuable additions to the number of summer-flowering trees which can be successfully used for the decoration of New England gardens.

**Some good shrubs.** Although notes are published year after year in these Bulletins about new or little known shrubs as they flower, the Arboretum is constantly asked for lists of the best new shrubs for northern gardens; and in response to this request it now submits another list of comparatively new plants. The plants in this list are hardy in southern New England and the middle states. The two Rhododendrons, however, cannot be grown in soil impregnated with lime. Several of these plants cannot, unfortunately, be found in American nurseries; they

are, however, easily propagated and a demand for them will in time produce a supply. The list contains the names of eighteen of "the best" new shrubs; it might easily be increased to a hundred for there is a large number of new or little known shrubs now growing in the Arboretum which American garden-makers unfortunately neglect. The plants selected today are:—*Hamamelis mollis*, *Prinsepia sinensis*, *Corylopsis Gotoana*, *Amelanchier grandiflora*, *Forsythia intermedia spectabilis*, *Cotoneaster hupehensis*, *C. racemiflora soongorica*, *C. nitens*, *C. multiflora calocarpa*, *Rosa Hugonis*, *Neillia sinensis*, *Rhododendron Schlippenbachii*, *R. japonicum*, *Berberis Vernae*, *Syringa Sweginzowii*, *Spiraea Veitchii*, *Philadelphus purpurascens*, and *Evonymus planipes*.

Like the other Witch Hazels of eastern Asia, *Hamamelis mollis* blooms in the winter and the flowers are not injured by the severe cold to which they are subjected in the Arboretum. This plant has handsome foliage and larger and more brightly colored flowers than the other Witch Hazels, and is invaluable for the decoration of winter gardens. *Prinsepia sinensis* is considered here the best shrub the Arboretum has obtained from Manchuria. It is valuable for its perfect hardness, the fact that its dark green leaves unfold before those of any other shrub in the Arboretum, with the exception of those of a few Willows, and for its innumerable clear yellow flowers which open before the leaves are fully grown. The stems of this shrub are armed with stout spines and it should make a good hedge plant. *Corylopsis*, which is an Asiatic genus related to the Witch Hazels, has handsome yellow, early spring flowers in drooping clusters which appear before the leaves. There are several Japanese and Chinese species in the Arboretum but only the Japanese *C. Gotoana* has been uninjured here by the cold of recent years, and it is the only species which can be depended on to flower every year in a Massachusetts garden. The *Forsythia* of the list is still the handsomest of the varieties of *F. intermedia* which is the general name of the hybrids between *F. suspensa Fortunei* and *F. viridis*. This variety was raised in a German nursery and is the handsomest of all the Forsythias now known in gardens. *Amelanchier grandiflora* is believed to be a hybrid between the two arborescent species of the eastern United States, *A. canadensis* and *A. laevis*, and is by far the handsomest of the Amelanchiers in the large Arboretum collection of these plants. It came here from Europe but what is believed to be the same hybrid has been found in several places in the eastern states. The four Cotoneasters in the list are perhaps the handsomest of the twenty odd species introduced by Wilson from western China. They are all large shrubs of graceful habit, and have white flowers and red fruits with the exception of *C. nitens* which has red flowers and black fruit. In recent years the Arboretum has made few more important introductions for American gardens than the Chinese Cotoneasters. Although no longer a "new plant" *Rosa Hugonis* is included in this list because it is not only the handsomest of the Roses discovered in China during the last quarter of a century, but in the judgment of many persons it is the most beautiful of all Roses with single flowers. Fortunately for American garden-makers the value of this Rose is appreciated by a few American nurserymen from whom it can now be obtained. The introduction of *Neillia sinensis* made it possible to add to the Arboretum collection a representative of

a genus of the Rose Family which had not before been cultivated in the Arboretum. There are now other species of *Neillia* grown here but some of them are not entirely hardy, and others have no particular value as garden plants. *Neillia sinensis*, however, has never been injured by cold, and with its drooping clusters of pink flowers is a handsome plant well worth a place in any garden. *Rhododendron (Azalea) Schluppenbachii* is one of the most important introductions of recent years. A native of northern Korea, it grows further north and in a colder country than any other Azalea, with the exception of the *Rhodora*, and there can be little doubt that it can be grown successfully in the open ground much further north in the eastern United States than any of the other Asiatic Azaleas. It may be expected, too, to prove hardy further north than the American species with the exception of *Rhodora*. The large pale pink flowers of this Azalea, although less showy than those of a few of the other species, are more delicately beautiful than those of any of the Azaleas which have proved hardy in the Arboretum. There are a few plants of this Azalea large enough to flower in the United States, and many seedlings have been raised here and in Europe during the last two years. Until these are large enough to flower it will probably remain extremely rare. *Rhododendron (Azalea) japonicum* cannot be called a new plant for it has been growing in the Arboretum since 1893, but it is such a valuable plant and is still so little known or understood that it can perhaps properly find a place in a list like this. The large, orange or flame-colored flowers make it when in bloom one of the showiest of all the hardy Azaleas. *Berberis Vernae* has been mentioned in a recent number of these Bulletins; and it is only necessary to repeat what has already been said about it, that it is a hardy plant of exceptionally graceful habit among Barberries, with arching and drooping branches from which hang innumerable slender clusters of small yellow flowers followed by small red fruits. *Berberis Vernae* has proved the handsomest of the large number of Barberries with deciduous leaves found by Wilson in western China. Among the numerous species of Lilacs introduced into gardens from China during recent years *Syringa Sweginzowii* is considered the most beautiful by many persons. It is a tall shrub with slender erect stems which produce every year great quantities of pale rose-colored, fragrant flowers in long rather narrow clusters. It has the merit of being almost the last of the Lilacs in the Arboretum collection to bloom. *Spiraea Veitchii* has the merit, too, of being the last of the white-flowered Spiraeas to flower. It is a shrub already 6 or 8 feet tall in the Arboretum, with numerous slender stems and gracefully arching branches which about the first of July are covered from end to end with broad flower-clusters raised on slender erect stems. This *Spiraea* is one of the best of the hardy shrubs discovered by Wilson in western China, and by many persons it is considered the handsomest of the genus as it is now represented in the Arboretum. *Evonymus planipes* is a native of northern Japan and a large shrub with large dark green leaves and the inconspicuous flowers of the genus; and it is only on account of the beauty of its fruit that this plant is included in this list, for the fruit which hangs gracefully on long slender stems is large, crimson, very lustrous and more showy than that of any of the other Burning Bushes in the Arboretum.



ARNOLD ARBORETUM  
HARVARD UNIVERSITYBULLETIN  
OF  
POPULAR INFORMATION

JAMAICA PLAIN, MASS.

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**Grape Vines.** Summer is the time to study Grape Vines as ornamental plants for they do not unfold their leaves until late in spring and the first severe frost blackens them in early autumn. For the summer covering of walls or fences, to spread over hillsides and among rocks, or to train over arbors, no other vines compare with them in vigor and rapidity of growth, or in beauty of foliage. The fragrance of the flowers, too, of several of the species should find a place for them in gardens. The Arboretum collection of Grape Vines is a large one and contains all the North American species, with the exception of two or three species which grow only in the extreme southern states and the California species which does not take kindly to the conditions which it finds in the eastern states. The collection contains, too, several Asiatic species. The plants have been trained on a long trellis on the upper side of the Shrub Collection in order to make it easy for students to compare the different species growing under the same conditions and note the variation in the shape, size and color of the leaves. Grape Vines, too, have been largely used for covering the boundary walls of the Arboretum, and their value for this purpose can be well seen near the Jamaica Plain and Forest Hills entrances, and on Centre Street above the gate of that name. An example of the way in which Grape Vines can be used for covering bare ground can be seen at the junction of the Meadow and Bussey Hill Roads. Here the plants are cut back severely every spring. Although the Arboretum has made it possible for garden lovers to become acquainted with the beauties of these plants, they are apparently little appreciated or planted and it is impossible to find several of the handsomest of the American Grape Vines in American nurseries.

Among the species unknown in most gardens, although well worth a place in any park or garden where handsome plants are valued, are *Vitis Doaniana* and *V. cinerea*. The first is a native of the Texas Panhandle and in the Arboretum has proved to be a fast-growing and hardy plant. The leaves are large and thick, and their pale bluish green color gives to this plant a distinct appearance. The fruit, which is covered with a glaucous bloom, is arranged in small clusters. *Vitis cinerea*, which is sometimes called the Sweet Winter Grape, has large, nearly entire or slightly three-lobed leaves which are dark green on the upper surface and gray on the lower surface which, like the young shoots, is covered in spring with thick gray tomentum. The berries are small and black and destitute of bloom. When Jacques Cartier sailed up the Saguenay in 1535 Grape Vines covered with fruit fired his imagination. The plant he saw was the Frost Grape, *Vitis vulpina*, with its shiny and usually three-lobed leaves and small, juicy, acid blue fruits. A better acquaintance probably cooled the Frenchman's enthusiasm for the wonderful fruits of the New World. *Vitis vulpina* grows further north than the other American species and is a common river-bank plant in the northern states as far west as the Dakotas and Kansas. Excellent jelly is made from the fruit. A species of the middle states, the Frost or Chicken Grape, *Vitis cordifolia*, can also be seen in the Arboretum. From *Vitis vulpina* it differs in its unlobed or only slightly lobed leaves and in their much smaller stipules. The small bluish black berries in large clusters do not ripen until after severe frost when they become sweet and edible. The Frost Grape is one of the largest and most vigorous of the American species, often growing to the tops of the tallest trees and forming stems from one to two feet in diameter. A more slender and smaller plant, *Vitis palmata*, with leaves deeply divided into long-pointed lobes and sweet black fruit is one of the most distinct of all the American Grape Vines. Its small size makes it more suitable for small gardens than the larger and stronger growing species. The small, distinctly gray-green leaves make the species of the southwestern states, *Vitis arizonica*, one of the interesting plants of the collection, although for the purpose for which Grape Vines can be best used in ornamental planting it is one of the least valuable of the American species. It is not very hardy and requires winter protection to insure its best growth. Another interesting Grape Vine, *Vitis rupestris*, has little to recommend it as a garden plant. It grows only a few feet tall and the small shining leaves are abruptly pointed and coarsely toothed. The small sweet fruit in small compact bunches ripens in summer. This little Grape Vine is said to grow from southern Pennsylvania to Missouri and southward, but it is most abundant on the low limestone hills of western Texas. For pomologists the northern Fox Grape, *Vitis labrusca*, the common wild Grape Vine of eastern Massachusetts, is the most important for by selection and hybridization it has produced most of the table grapes which can be successfully grown in the open ground in eastern North America. The berries of the wild plant are thick-skinned with tough musky pulp. This peculiar flavor is retained in a greater or less degree in the cultivated varieties, and distinguishes them from the varieties of the European grapes which cannot be successfully grown in the open in eastern North America. Apart from its fruit the northern Frost Grape is

one of the handsomest of the northern species, for the leaves, which vary in size and lobing on different individuals, are thick, dark green and lustrous above and covered on the lower surface with tawny white, tan-colored or red-brown felt which is also found on the young stems and branches. Several forms of this vine are in the Arboretum collection. The summer Grape of the northern and central states, *Vitis bicolor*, is an even handsomer plant, and perhaps the handsomest of our northern Grape Vines. The large leaves are usually deeply lobed, and dark green above are pale blue-green below. These are only a few of the American Grape Vines in the collection. The large-fruited Muscadine or Southern Fox Grape, *Vitis rotundifolia* of the southern states, has not yet proved hardy in the Arboretum. From this species, after *V. labrusca* the most important pomologically of the American Grape Vines, has been produced the Scuppernong grapes, favorites in the southern states.

To Japan we are indebted for *Vitis Coignetiae*, the handsomest Grape Vine which can be grown in the northern states. No other species is more hardy, grows so vigorously, or produces such large leaves which are thick, prominently veined and pale on the lower surface; they turn bright red in the autumn, and as this is a northern species their fading colors are more brilliant in northern New England than they are in Massachusetts. The small blue fruit which is eaten in Hokkaido has little to recommend it to the American palate. *Vitis amurensis* from eastern Siberia, Mongolia and Korea is an old inhabitant of the Arboretum. It is a handsome and perfectly hardy plant, but not superior as a garden plant to several of the American species. The Japanese *Vitis pulchra* is distinct in the dark red color of the leaves and shoots in spring, and is a handsome and interesting plant. This Vine is known only from cultivated plants, and only the male plant is in the Arboretum collection.

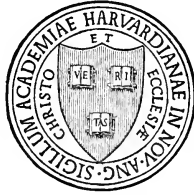
The Chinese *Vitis Davidii* is interesting to the students of these plants for, unlike those of other Grape Vines, the stems are covered with sharp spines. The leaves turn bright red in the autumn. Unfortunately the stems are killed down to the ground by the cold of our severest winters, and this remarkable plant rarely produces fruit in this climate. Equally interesting, perhaps, is another Chinese species, *Vitis Pagnuccii*, with some leaves which are scarcely or not at all lobed and with others on the same branch which are deeply and variously lobed much like those of the Virginia Creeper. Wilson discovered a number of handsome Grape Vines in western China and most of them have been raised in the Arboretum. Not many of these new species have been really hardy here, and it does not now appear probable that any of them will prove good garden plants in this climate.

Excellent white and purple grapes, varieties of the European *Vitis vinifera*, are grown in northern China for the Peking market on the descendants of plants brought centuries ago by the overland route probably from Persia or Asia Minor. In Peking the plants are laid down and covered with earth during the winter, and produce large crops of fruit which the Chinese are able to keep until spring in cool cellars. This Grape has been growing in the Arboretum for sixteen years with only slight winter protection, and the green-fruited variety has produced fruit

here several times. This is the only form of *Vitis vinifera* which it has been possible to grow here, and it would seem to be a good subject for plant breeders anxious to produce better grapes for northern markets.

**Chinese Roses.** The severe winter like that of 1917-18 has injured several of the Roses of western China, although apparently none of them have been killed. *Rosa Helenae*, the handsomest perhaps of the Roses discovered by Wilson, has lost much of its wood and will not flower this year; and *Rosa multibracteata*, which has not been injured before, has been killed to the ground. The Chinese form of *Rosa Roxburgii* (var. *normalis*), which flowered last year for the first time in the Arboretum, has had no flowers this season, although the wood has not been much injured. *Rosa Moyesii* has been little injured, but has flowered very sparingly and in the Arboretum has never lived up to the reputation it has gained in England. *Rosa Hugonis* was not injured by the winter, but it did not produce quite such a large crop of flowers as in previous years, and one exceptionally hot day nearly ruined these just as they were opening. No new development among Roses shows that the beauty of the flowers of Father Hugo's Rose is equalled by that of any other Chinese species. Uninjured by the cold of the past winter, the form of *Rosa multiflora* from western China (var. *cathayensis*) has not before been more thickly covered with its pale pink clustered flowers. This Rose can be grown as a bush with long arching stems as it appears in the Arboretum, or it can be used successfully to cover a large arbor, as it has in another Massachusetts garden. The flowers are as beautiful as those of most of the popular Rambler Roses of garden origin, and the plant is hardier than many of these Roses. To the students of Roses this form of *Rosa multiflora* is of interest as the wild type from which the Chinese obtained the popular "Crimson Rambler" Rose which for centuries before it was brought to this country had been a popular garden plant in China. *Rosa bella*, introduced by the Arboretum from northern China into western gardens, has never been injured here by cold. It is a tall stout shrub which produces every year in June great numbers of large rose-red flowers followed by showy fruits. A good garden plant for cold countries, *Rosa bella* might in the hands of a skilful plant-breeder have a useful influence in a new race of hardy Roses. The winter has not injured *Rosa caudata* which promises to be one of the most useful of the western China Roses. It is a Cinnamon Rose and a vigorous growing shrub now more than six feet high, with stout arching stems covered with stout spines, handsome foliage and flowers two inches in diameter with pure pink petals marked with white at the base. The broad flower-clusters sometimes contain as many as twenty-five flowers, and as these open gradually the plant remains in bloom during at least a couple of weeks. The value of this Rose as a garden plant is increased by the fact that it is one of the few Roses in the collection which flower in July, and that its large orange red fruit is exceptionally handsome. *Rosa omeiensis* was not hurt during the past winter, but the form of this Rose (var. *pterocantha*) with the stems furnished with large bright red translucent spines lost considerable wood in the Shrub Collection.

These Bulletins will now be discontinued until the autumn.

ARNOLD ARBORETUM  
HARVARD UNIVERSITYBULLETIN  
OF  
POPULAR INFORMATION

JAMAICA PLAIN, MASS.

OCTOBER 18, 1920

**The Ailanthus.** The Tree of Heaven of the Chinese, which botanists now call *Ailanthus altissima*, although it is still better known as *Ailanthus glandulosa*, is one of the remarkable trees of the northern hemisphere. Raised in Europe in 1751 from seeds sent from Peking, the Ailanthus was one of the first Chinese trees known in western countries. The first Ailanthus was planted in the United States by William Hamilton in 1784 in his famous garden near Philadelphia; and in 1804 it was first planted in New England near Portsmouth, Rhode Island, where it is still abundant. For many years little attention was paid to the Ailanthus in Europe until it was found that one of the silk worms could be successfully fed on its leaves. This discovery led to the establishment of great Ailanthus-plantations in France where they have succeeded beyond the most sanguine expectations, the best results having been obtained in calcareous soil and on the sandy seacoast.

The date of the first planting in Europe of the Ailanthus as a street tree is not known, but when the streets of Paris were generally bordered by trees in the early years of the second Empire it was largely and successfully used for this purpose. As early as 1820 its remarkably rapid growth, the tropical appearance of its long gracefully drooping leaves and its freedom from the attacks of insects attracted general attention to the Ailanthus in the United States. It was found to flourish equally well in the country and in the streets of New York and Philadelphia where it grew more rapidly than any tree which had been planted in those cities; and it was believed that a tree had been found which would take the place of all others for city planting. So great did the popularity of the Ailanthus become in a few years that the

number of the trees planted was only limited by the ability of nursery-men to supply the demand. The popularity of the *Ailanthus* in the United States, however, was short-lived, for when the trees began to flower it was found that some of the flowers emitted a strong and to most persons an offensive odor, that the clouds of pollen shed from the flowers and the flowers themselves dropping on neighboring roofs so affected the water caught on them that it was unfit for use, and that the flowers which dropped on the ground made the city sidewalk and the country yard unbearably disagreeable. This peculiarity of the flowers discovered, the *Ailanthus* sank rapidly in popular esteem, and its general destruction in this country was advocated and put into execution.

Unpopular as the *Ailanthus* has become, it is one of the handsomest and most valuable trees in the world. Planted in cities it can resist better than any other tree heat, drought, dirt, and gas escaping from defective pipes which menace the life of city trees. It grows rapidly even in the most unpromising situations; it is never seriously injured by insects; and few trees can be more easily propagated, for small pieces of the root covered with soil will soon grow into plants large enough to transplant. The suckers which the *Ailanthus* produces in great numbers from the roots are the real drawback to this tree, but when it is planted in city streets they are unable to force their way through brick sidewalks and concrete is impervious to them. The male and female flowers of the *Ailanthus* are chiefly produced on different trees; only the male flowers have a disagreeable odor and drop to the ground. The female flowers are scentless. In the clusters of female flowers occasional male flowers are found, but there are so few of these that their odor is not perceptible. It is perfectly easy to propagate only the female tree which is the one which should be planted, and apart from the absence of the disagreeable smell of the flowers it is more ornamental than the male for the winged fruit of the *Ailanthus* produced in great terminal clusters is handsome and conspicuous in the late summer and autumn. The fruit is usually yellow, but in one variety it is bright red (var. *erythrocarpa*) and more brilliant and conspicuous than the fruit of any tree of large size which can be grown in the northern states. The leaves of the red-fruited variety are darker on the upper surface and paler below than those of the yellow-fruited form; and the handsomer leaves and more brilliant fruit make this the desirable form to cultivate. There is certainly no better tree than the *Ailanthus* to shade the streets of American cities provided they afford sufficient room for its development, for the *Ailanthus* even when it is planted in cities may become a tall, wide-branched tree, demanding space in which to display all its beauties. Although the attempt has not been made on a large scale in this country to fix shifting sand dunes by planting the *Ailanthus*, it has been successfully used for this purpose in Europe especially in the neighborhood of Odessa on the Black Sea where large plantations of *Ailanthus* have been successful on sterile soil so shifting that other trees have not been able to secure a foothold on it. The Tree of Heaven produces valuable hard, heavy and close-grained wood of a pleasant clear yellow color, resembling that of satinwood; it is easily seasoned, and shows as little tendency to shrink or warp as the best mahogany. Beautiful furniture has been made from *Ailanthus*-wood raised in New England, and if the tree is ever

grown on a large scale on the sandy now unused lands of our seacoast it will supply the cabinet-maker with wood which in quality and beauty equals that of the White Oak, the Black Walnut and the Wild Cherry. It is an interesting fact that although the *Ailanthus* is now known in all the countries of the world which enjoy a temperate climate its true home in China, that is the region where it is a really wild tree, is still unknown to European and American botanists who have now travelled in nearly all parts of the Celestial Empire. Two other species of *Ailanthus*, *A. Giraldii* and *A. Vilmoriniana*, are known, however, as wild trees in western China. The former which differs in the presence of prickles on the branches has not proved hardy in the Arboretum; the other, which chiefly differs from the common *Ailanthus* in the downy covering of the young branchlets, is now established here but has not yet produced flowers or fruits.

**Mountain Ashes.** The abundant flowers on these trees and shrubs last spring have been followed by an unusually heavy crop of fruit on most of the species, and Mountain Ashes have probably never been more beautiful in this part of the country than they are this autumn. Their fruit is now the most conspicuous in the Arboretum and deserves the attention of persons interested in plants which produce handsome and conspicuous fruits. There are two principal groups of Mountain Ashes in the Arboretum, one on the bank above the Shrub Collection and near the Forest Hills gate and the other on the left hand side of the Valley Road near and under the group of Swamp White Oaks. None of these plants have more abundant or brilliant fruits in larger clusters than the two Mountain Ashes of northeastern North America, *Sorbus americana* and its variety *decora* with broader leaflets and larger fruits. The value of these two trees is increased by the brilliant colors which their leaves will take on now in a few days. The various forms of the European species, *Sorbus Aucuparia*, in the collection are all fruiting well this autumn, the handsomest perhaps being a tree from northern Austria known as var. *moravica* or *dulcis*. This is a tall, slender, fast-growing tree with smooth bark, leaves with narrower leaflets than those of the common form, and larger and sweeter fruit which in its native country is used as food. The leaflets of the European Mountain Ash vary greatly in width, and in the group near the Forest Hills gate there is a handsome specimen of this tree with exceptionally narrow leaflets. The branches of the large plant of the Japanese *Sorbus commixta* in this group have never before been so weighed down by its clusters of small fruit although it has been growing in the Arboretum for more than thirty years. The bright orange and red autumn colors of the leaves add to the value of this tree. Near it a small plant of *Sorbus amurensis* from eastern Siberia is fruiting well for the first time in the Arboretum. The plants of *Sorbus pekinensis* which are in the Valley Road-Group have been covered with their large, open, drooping clusters of yellow fruit which is now beginning to fall. Both in spring and autumn this slender tree with narrow leaflets is handsome and conspicuous. It well deserves a place in collections of such plants. In this group, too, *Sorbus pohuashanensis*, so named from the mountain range in northern China, the Pohua-shan, where it was discovered, is covered with its erect clusters of large orange-red fruits. It is a handsome plant with leaflets broader than those of the common form of the European

Mountain Ash but no better for gardens in this country than that tree which is gradually becoming naturalized in this country. In the Arboretum, at least, the handsomest trees have sprung from seeds scattered by birds. One of the handsomest and certainly the most interesting Mountain Ash in the Arboretum is growing in the nursery near the top of Peter's Hill. It is a fast-growing tree of perfect shape, with a straight stem covered with smooth pale bark, leaves with unusually narrow leaflets, and wide, convex, compact clusters of pink fruit. No other Mountain Ash which is now known has fruit of this color. This tree which was grown in the Arboretum from seed was first thought to be a form of *S. pekinensis*; it is now believed to be a hybrid of *S. Aucuparia* and *S. pekinensis* to which the name of *S. Arnoldiana* has been given. In the convex, crowded clusters of flowers and fruits it shows the influence of the European plant; in the narrow leaflets and in the size of the small fruit it resembles *S. pekinensis*, while in color the fruit is intermediate between those of its supposed parents.

**Autumn Colors.** There is not yet any great show of brilliant colors in the Arboretum and the leaves of many trees, especially the Oaks, are as green as they were at midsummer, but as in northern New England the leaves of the Sugar Maples, the Birches and other northern trees are reported to be more brilliant than usual a good coloring of many trees may be expected before the end of the month. A few spots of bright color, however, are to be seen here, and these are mostly made by Asiatic trees and shrubs. Already the bright clear yellow leaves of the Siberian Cork-tree (*Phellodendron amurense*) have disappeared from this small tree which is most interesting in the thick, pale, deeply furrowed bark which covers the trunk and larger branches. Last week *Acer mandshuricum*, a Box Elder of northeastern Asia, with clear pure pink fading leaves was from the rarity of this autumn color the most interesting object in the Arboretum. This Maple is one of the largest and handsomest trees in Manchuria, but although other trees of the same region flourish here it has not yet found a place in the Arboretum which suits it, and as yet gives little promise of large size or old age. This is to be regretted for it is as beautiful in the spring as in the autumn, as the unfolding leaves are deep red. The leaves of a Japanese Burning Bush, *Evonymus alatus*, are just turning to the deep rose color which is unlike that of any other plant in the Arboretum at this season of the year and which makes it one of the most desirable of the perfectly hardy shrubs which can be used for the decoration of New England gardens. Very beautiful this autumn is a Chinese Sumach, *Rhus javanica*, which rivals our native species in the scarlet color of its leaves. This Sumach is a small round-headed tree which produces its large terminal clusters of white flowers at the end of July or in early August. The showy summer flowers and the brilliant October foliage should make this tree better known. In October the leaves of no North American tree are more brilliant than those of *Acer ginnala*, a Maple of eastern Siberia with deeply divided leaves and compact clusters of fragrant flowers. Unfortunately the leaves of this handsome tree fall soon after changing color.



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**Some American Plum-trees.** North America is the real home of Plum-trees as it is of Hawthorns. They range across the continent and from the valley of the St. Lawrence nearly to the Rio Grande. Plum-trees are most abundant in eastern and southern Kansas, eastern Oklahoma, southern Arkansas, and Texas from the valley of the Red River to the Edwards Plateau. In this region Plums are represented by more species than are found in all the world outside of North America. Some are trees of considerable size and others are large or small shrubs which frequently spread in sandy soil by means of shoots from the roots into often impenetrable thickets covering many acres. It has proved difficult to obtain the material needed for a proper study of these plants. They flower early when there is little else in bloom to occupy the collector, who is obliged to make long and expensive journeys to collect the flowers of one genus. In four years out of five the young fruit is destroyed by frost which in that region usually comes after the flowering of Plum-trees; and when the fruit is not destroyed it is often difficult to obtain, for it usually ripens at the season when heat and insects make plant collecting difficult and disagreeable. The different species are often widely separated and this makes impossible the careful comparative study of the living plants needed to understand properly their similarities and differences. There is little hope, therefore, that American Plums can be thoroughly understood before all or most of the species can be grown together in one garden until they flower and ripen their fruit. Such a collection will be difficult to establish and maintain, for some of the interesting species are not hardy in the north, and it is not probable that such a collection will be undertaken except in some

of the northern states. Fortunately several years ago the Park Department of Rochester, New York, with an intelligence and foresight not always shown by municipal officials, sent one of its assistant superintendents to Oklahoma and Texas to study the wild Plums and to collect living plants and other material needed for their better understanding. The result of several expeditions is a remarkable collection of hundreds of living plants which makes Rochester the best place to see and study the Plum-trees of the Arkansas-Oklahoma-Texas region, that is the region where there are more of these plants than anywhere else in the world. A preliminary study of the collection reveals numerous interesting new forms, some of them hybrids and others possibly new species. It shows, too, that among these Plums are plants of exceptional beauty when their fruit ripens. All Plums are handsome when in early spring their white flowers cover the leafless branches; on some species the flowers are rather larger than on others, but as flowering plants there is no great choice between them. They greatly vary, however, in their leaves and in the size and shape of their fruit. From the fruit of nearly all American Plums good jellies and preserves can be made, and selected seedling forms of several of the species have received the attention of pomologists and are now cultivated as fruit trees in parts of this country where the varieties of the European *Prunus domestica* cannot be successfully grown. As ornamental plants merely the value of some of the American Plums is not yet understood. The handsomest of them, *Prunus hortulana*, the most beautiful of all Plum-trees, is common from southeastern Illinois to eastern Kansas and Oklahoma. It is a tree from twenty to thirty feet high with a clean trunk and wide-spreading branches which form a round-topped shapely head. The leaves are unusually large for a Plum-tree, and smooth and very lustrous on the upper surface. The fruit ripens late in September and in October, and is globose or slightly longer than broad, scarlet, lustrous, and from three-quarters of an inch to an inch in diameter. It is produced in great quantities and ripens before the leaves change color or fall; and a well-fruited tree of *Prunus hortulana* is more beautiful in early October than any Crabapple or Hawthorn, or indeed than any other small tree which can be grown in the northern states. In the Rochester collection are plants of *Prunus hortulana* which are not trees but wide-spreading shrubs which should prove useful in gardens too small for the proper display of the tree form. *Prunus Reverchonii* has also proved a success at Rochester. On the prairies of eastern Texas it is a low shrub often spreading into great thickets, but in cultivation at the north it is inclined to become a small tree. The leaves are smaller and less lustrous than those of *P. hortulana*, and the fruit is smaller but equally brilliant and abundant. *Prunus venulosa*, another of the prairie species of eastern Texas, and the different forms of the Chickasaw Plum (*P. angustifolia*), especially the broad-leaved, large-fruited var. *varians*, and the different forms of *Prunus Munsoniana* of which the Wild Goose Plum is the best known, can now all be seen to advantage in Rochester. The "Big-tree Plum" so-called of Texas (*Prunus mexicana*), the largest, most abundant and most conspicuous Plum-tree of Texas, has also proved hardy in Rochester.

This tree is interesting as a conspicuous feature of the Texas flora, but less ornamental and less valuable as a fruit tree than most of the tree plums of the United States. Among the hybrids which have appeared from time to time in the Rochester parks is one between the Beach Plum (*P. maritima*) common on the northeast coast and the Wild Plum of the eastern states (*P. americana*). This hybrid is a bush five or six feet tall and eight or ten feet through the branches; it bears large crops of purplish fruit intermediate in size between that of its parents, and of better quality than that of either of them. Judging by the fruitfulness of this hybrid at Rochester it should prove a valuable plant for small gardens.

All the Plums which have been brought to Rochester from the southwest are growing in the Arboretum, but Boston is not sufficiently civilized to see and enjoy these plants at the season when they are most interesting, and in the case of several species most beautiful. In Rochester Plum-trees loaded with ripe and tempting fruit standing close to the sidewalks of streets near the parks and without the protection of a fence are not interfered with or injured. The fruit is there for the public to look at and enjoy, and spring and autumn throngs of visitors enjoy these wonderful plants. In the Arboretum it has been found necessary, in order to save the trees from injury, to pick every plum and cherry as they begin to color. Boys, and they are not always boys, break down the branches in their efforts to secure the half ripe fruit. Two years ago the best plant of *Prunus hortulana* in cultivation which had been growing in the Arboretum for twenty-eight years was so broken down that it was necessary to destroy it. It is the business of the Arboretum to furnish information about trees, and it is the public which suffers when the Arboretum is not protected from the public by the police and the courts.

**Street Trees.** There is at present a widespread interest in the United States in Nut-trees and their cultivation, and the general planting of Walnut and Hickory-trees on country roadsides in some of the northern states has been advocated. There are objections, however, to the use of these trees for such a purpose. Walnut and Hickory-trees are difficult to transplant, and the best success is obtained by planting one or two-year-old seedlings, that is plants only a few inches high. Such small plants must be kept clear of weeds and encroaching shrubs by which they might be easily destroyed, and with the best of care they would not be large enough to give much shade or produce many nuts in less than twenty-five or thirty years. The difficulty of growing the young trees can of course be overcome if cost is not considered; more difficult will be the protection of the trees when they bear nuts. Nuts are assiduously sought by men and boys who do not hesitate to break down nut-trees wherever they are left unprotected, and as the number of motor cars increase on country roads the facilities for robbing the trees will also increase.

The selection of trees for street and roadside planting presents many difficulties. In the interior of large cities, especially in those where bituminous coal is principally used, the *Ailanthus* is best able of all

trees to support the drought and dirt to which trees in cities are subjected. The Ailanthus, however, cannot be successfully used in narrow streets. The streets which are usually planted in this country are not in the business and most densely populated sections of cities but in their residential quarters and in their suburbs; and it is difficult to find the proper trees to plant along the usually narrow streets of their outlying districts. There are objections to most of the trees which generally have been used for this purpose. At the north the tree which has been most generally planted along streets is the American Elm-tree. It is one of the finest trees in the world, and as it may sometimes be seen shading the broad central street of an old New England village no street tree can equal it. The American Elm, however, will not flourish in sterile soil, and it cannot bear drought or atmosphere continually filled with dust and smoke. It needs room in which to grow, and its wide-spreading branches unfit it for the narrow streets usually found in the suburbs of large cities. Some of the Old World Elms are narrower trees, and the Hedge-row Elm of southern England, usually known in this country as *Ulmus campestris*, has grown well in Boston and its neighborhood for more than a hundred years and proved a better city tree than the American Elm. It is, however, too large a tree for the ordinary suburban street. The Sugar Maple is one of the best trees to plant by country roadsides, but the Sugar Maple cannot bear the hardships of city life, and even in suburbs usually languishes. The so-called Norway Maple (*Acer platanoides*) is much better able to adapt itself to the conditions trees have to put up with in cities and in their neighborhood. It has been largely used as a street tree, but the trunk is too short and the branches are too low and form too broad a head for a good street tree. What is needed for street planting are tall, fast-growing trees with erect or semi-erect branches forming a head narrow enough to find room between the curb and the property line but wide enough to shade the street. An American Elm which may be expected to be a valuable tree for street-planting has recently been discovered in the neighborhood of Rochester, New York. This tree is now from seventy to eighty feet high, with a short trunk from which spring several long erect main branches which form a head not more than eighteen feet in diameter. It will be largely propagated for street-planting in Rochester. In Rochester, too, have recently been found two Norway Maples with erect growing branches. The head of one of these trees is too narrow for street-planting, but the other with an oval head equal in width to a quarter the height of the tree promises to be useful for this purpose. In the cities of the Southern States the streets are usually wider than in the north and the Water Oak (*Quercus nigra*) finds room in which to develop; and there is not in any country a handsomer, and more easily managed street tree than the Water Oak, which unfortunately is not hardy anywhere in the north.

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**Conifers.** The Conifers in the Arboretum on the whole look fairly well considering the exceptional severity of the winters of 1917-18 and 1919-20. None of them have been killed this year; and the Black Pines of Japan (*Pinus Thunbergii*), which lost most of their leaves and suffered from the winter perhaps more than any conifer in the collection, are now thinly covered with young leaves, and if the coming winter is not too cold these trees, which had been growing in the Arboretum for twenty-seven years in perfect health, may entirely recover. Young plants of the Mexican White Pine (*P. ayacahuite*) and the California form of *Abies concolor* which lost most of their leaves are now covered with a new crop. Several plants of the variety of *Abies homolepis* with gray cones (var. *umbellata*) have been injured by cold, and this variety has generally proved to be a less desirable ornamental tree in the Arboretum than the blue-coned *A. homolepis*: the leaves are lighter-colored, and in habit the trees of the variety are more open and irregular, and are not worth general cultivation in this country. The Chinese Hemlock, *Tsuga chinensis*, was again badly injured by the winter and there now seems to be little hope that this interesting tree will be able to adapt itself to the New England climate. Trees of doubtful hardiness here, like *Abies grandis*, *Picea Breweriana*, *Tsuga heterophylla*, *Libocedrus decurrens*, *Chamaecyparis Lawsoniana*, and *Cryptomeria japonica* have in exceptionally protected positions been uninjured. The new Spruce-trees from the Chinese Tibetan border-land appear to be all hardy with the exception of *Picea Sargentiana* which has grown badly and is less hardy than the others. It is not probable that this tree will ever grow to a large size in this climate. The new Firs from western China have not grown as well as the Spruces, and, judging by the present appearance of the plants in the Arboretum, give little

promise of usefulness in this climate. All the new Chinese Pines are uninjured and are growing rapidly, but unfortunately the borer which disfigures the native White Pine (*Pinus Strobus*) and the Himalayan White Pine (*P. excelsa*) kills nearly every year the leader of the Chinese White Pine (*P. Armandi*). One of the Korean Firs (*Abies holophylla*) was first raised in the Arboretum sixteen years ago. It has proved perfectly hardy here and has grown rapidly, but the leaves are too yellow to make it a really ornamental plant. Possibly, however, the yellow leaves are due to improper or insufficient nourishment. Wilson from his journey in Korea brought back a large quantity of the seeds of this fine tree which he found making great forests in the northern part of the country, and for the plants raised here from these seeds it may be possible to find the soil and situation *Abies holophylla* requires.

Now that they have passed uninjured through such severe winters the statement often made in these Bulletins may be made again, that the best conifers which have been brought into Massachusetts from other parts of the United States and from foreign countries are the Carolina Hemlock (*Tsuga caroliniana*), the White Fir of Colorado (*Abies concolor*), the *Abies homolepis* of Japan, the so-called Red Cedar (*Thuja plicata*) of the northwestern part of this country, the Serbian Spruce (*Picea omorika*), the western White Pine (*Pinus monticola*), the Japanese White Pine (*Pinus parviflora*), the Golden Larch (*Pseudolarix amabilis*), and the Rocky Mountain form of the Douglas Spruce (*Pseudotsuga taxifolia*); and to this list must be added, although they are not true conifers, the Chinese *Ginkgo biloba* and the forms of the Japanese *Taxus cuspidata* which many persons believe is the most valuable plant Japan has sent to the United States.

*Tsuga caroliniana* was first raised at the Arboretum in 1884. The plants have grown more rapidly than those of the northern Hemlock (*T. canadensis*) and are now handsome trees with their lower branches resting on the ground. Even in the most exposed positions they have not suffered from cold; and in the Arboretum the Carolina Hemlock has proved to be one of the handsomest of the conifers which can be grown in Massachusetts. Seeds of the Colorado form of *Abies concolor* were first planted in the Arboretum in 1874 and the tallest plant in the collection is nearly sixty feet high and a perfect cone from the ground up. Like all Firs in this climate, this tree will sooner or later lose its lower branches, but for forty years at least the Colorado White Fir as an ornamental tree can be depended on here. The value of the Japanese *Abies homolepis* in the eastern states is less well known as this handsome tree is still rare in American collections, but with our present knowledge it is safe to speak of it as one of the best of the exotic conifers hardy in New England. It was not planted in the Arboretum until 1882, but the three largest specimens in the country, the one planted by Mr. Dana at Dosoris, Long Island, and those in the Hunnewell Pinetum and at Holm Lea, Brookline, Massachusetts, are now from fifty to seventy feet tall and furnished to the ground with branches. In the coast region of the northwestern states and of British Columbia *Thuja plicata* grows to a great size and is one of the handsomest and most valuable timber trees of North America. It ranges eastward to the mountains of Idaho and northern Montana; and

from this cold interior region it was brought to the Arboretum in 1879. It is the largest and handsomest of the *Arborvitæ*s and has proved to be one of the most satisfactory conifers which have been planted in the Arboretum. There are several specimens of the Serbian Spruce in the collection planted in 1886. It is perfectly hardy and one of the handsomest Spruce-trees which can be grown here. Unfortunately the leader is too often destroyed by the borer which disfigures *Pinus Strobus* and other White Pines. What is probably one of the best specimens in the United States of that form of *Pinus parviflora* with wide-spreading branches so common in Japanese gardens has been growing in the Arboretum since 1881. There is also a specimen here of the wild form of this tree from the forests of northern Hondo which was once called *Pinus pentaphylla*. Fortunately *Pinus parviflora* is not injured by the borer which destroys the leaders of many White Pines, but it is somewhat disfigured by the cones which are very numerous, and, persistent for a long time on the branches, turn nearly black before falling. *Pseudolarix*, the so-called Golden Larch of Japan, is one of the handsomest and hardiest exotic trees which can be grown in the eastern United States into which it was introduced more than sixty years ago. It was not planted in the Arboretum until 1891, but the trees here are large enough to show their beauty and are already producing seeds. *Pinus monticola*, the western White Pine, is not as handsome as our native *Pinus Strobus* and will probably never be much planted in the eastern states. It is interesting, however, as the only Pine-tree of western North America, one of the chief homes of the genus, which is really hardy in the east. It has not yet been injured here by borers. The Rocky Mountain form of the Douglas Spruce is now too well known in eastern plantations to require comment.

**Junipers.** The Arboretum collection of Junipers has improved in the last three or four years and now contains many interesting and healthy plants. It must be remembered, however, that the northeastern part of the United States has not the climate needed for the large number of the species which grow naturally either in warmer countries or in regions of small summer rainfall or of high altitude. The range of variation of the so-called Red Cedar, *Juniperus virginiana*, although a much handsomer plant south of New England than it is here, is now well shown in the Arboretum collection which contains eighteen named varieties of this tree. Nearly all of these varieties are distinct, but in some cases the same or nearly the same plant has come to the Arboretum under more than one name. In color the most distinct of the varieties of the Red Cedar is the var. *glauca* with steel gray leaves, represented in the collection by a number of plants varying somewhat in habit but little in color. This form has not been attacked here by the red spider or by the other insects and the diseases which often disfigure and sometimes kill the common green-leaved form of this tree in Massachusetts. With the exception of *Abies concolor* this Juniper is the handsomest of the gray-leaved conifers which can be grown in this climate. *Juniperus virginiana globosa*, a plant with a cylindric, round-topped little head which came from a Dutch Nursery, is interesting to the students of the now popular dwarf conifers. More beautiful is another Dutch form (var. *Kosteriana*), a flat-topped shrub from two to

three feet high, with long, wide-spreading branches and open habit. This is a useful plant when it can be given sufficient space in which to spread, but is of course more open in habit than that form of the Red Cedar which sometimes grows on the exposed sea-cliffs of the Maine coast, and in such positions forming a wide mat only a few inches high, is perhaps more beautiful than any other prostrate Juniper. Seedlings and grafted plants of this form are growing in the Arboretum but are too young to show if they can retain in more favorable surroundings the extreme prostrate habit due no doubt, in part at least, to the exposed position of the wind-swept sea-cliffs where these plants have grown. Among conifers with more or less pendulous branches few are more beautiful than the pendulous form of the Red Cedar (var. *pendula*). There are several of these trees in the collection, sent here from European nurseries or found in the country. They vary slightly among themselves but are all worth a place in the garden. Among the other varieties of the Red Cedar are several of compact habit and bright green leaves. The most distinct of these are perhaps the varieties *elegantissima*, *pyramidalis*, *Schottii* and *Chamberlaynii*. They probably originated in European nurseries from which they came to the Arboretum.

The Juniper of northeastern continental Asia, *J. chinensis*, is a valuable tree and many of the varieties, especially those of dwarf habit, are popular. Some of these varieties are good garden plants, but others are usually so disfigured by the red spider that unless they are frequently and carefully sprayed they are not worth growing. The best of these dwarf plants, the var. *Pfitzeriana*, is a shrub with irregularly placed rather pendulous branches, which can be trained into a low broad pyramid a few feet high. The branches are sometimes broken by a heavy weight of snow, but nothing else seems to trouble this plant. There are other dwarf upright forms of the Chinese Juniper with green or with bright yellow leaves which are growing well here; and the form with prostrate branches forming a dense low mat found by Professor Sargent in Japan and named for him is the best of the Asiatic prostrate Junipers in the collection. An even more prostrate plant, in this climate, at least, the most reliable and the fastest growing of prostrate Junipers is the North American *Juniperus horizontalis*. This is widely distributed from the sea-cliffs of the coast of Maine to the northern Rocky Mountains. The behavior here of *Juniperus conferta* is disappointing. It is the Japanese sand-dune prostrate Juniper, ranging from Saghalin in the north to the tropical Lu-chu Islands in the south. It was first noticed by Europeans on the shore of Hakodate Bay in the extremely cold climate of southern Hokkaido. A plant from this region might be expected to be hardy here and it is believed that this Juniper would prove useful to plant on the sand-dunes of Cape Cod and other parts of the north Atlantic coast. In the Arboretum, however, it exists only in sheltered positions and loses many branches every winter. This tenderness is due perhaps to the fact that it grows so late in the season that young wood does not become thoroughly ripened. When the right place is found for it *Juniperus conferta* with its pale green leaves will be one of the handsomest and most distinct prostrate Junipers.

These Bulletins will now be discontinued until next spring.



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